



# CHART PROGRAM

## ATMS R17

### DETAILED DESIGN

Version 1.2  
Work Order 09 Deliverable 2  
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## Revision History

Date	Version	Description	Page Affected	Author
09/22/2016	1.0	Initial release		
12/22/2016	1.1	Corrected the cover page title, doc#, and the file name;	Cover Page	Delena McFadden-Mello
03/08/2017	1.2	Corrected the cover page title, doc#, and the file name;	Cover Page	Michael Fleming

## 1 INTRODUCTION

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### 1.1 Purpose and Scope

#### 1.1.1 Purpose

This document describes the design of the software for CHART ATMS Release 17. The CHART ATMS R17 release provides the new features listed below. These features are being developed under work order WO 9.

- **WO 9 PRs:** Several problem reports are addressed in this release. Following is a list of these PRs, with their identifying number and short description:

**ATMS-612:** The system will be configured such that after future deployments, users' browsers will automatically pick up changes to JavaScript and CSS files (rather than continuing to use the cached old versions of these files). This will help reduce post-deployment errors and support calls.

**ATMS-847:** A problem where data was not being deleted from the DMS\_TRAV\_ROUTE\_MSG\_MSGS\_LOG table in the archive database will be fixed.

**ATMS-869:** A correction will be made to the DMS functionality to persist updates to the Travel Routes Consumer table whenever a DMS indicates to the Travel Route Service that it is no longer a consumer. If the Travel Route Service is restarted, this will help to avoid initialization of the all the DMSs that were ever consumers of its data.

**ATMS-882:** An error message will be displayed when adding a banned word to the Manage TTS Pronunciation Page. This message will be corrected with the descriptive text of the banned word.

**ATMS-888:** The date format within the CHART log files is inconsistent with one another which produces complications when dealing with log messages during production issues. In order to improve issue resolutions, YYYY/MM/DD will be used for a more consistent and readable format.

**ATMS-1239:** The capability to set the Comm Loss Timeout for multiple DMSs at a time will be added to the system. This will be helpful during deployments to prevent the signs from blanking themselves while the ATMS software is down. The system will support the ability to back up and restore the timeouts that were previously configured for the affected signs, and to remove the backup data when no longer needed.



**ATMS-1526:** There is a typo error in the current NTCIP Camera Details Page which will be addressed in this issue.

**ATMS-1685:** When editing a system trigger condition from the ATMS GUI -> General -> Triggers Page, a correction will be made to correct the erroneous units field data (Miles, Degrees \*F, etc) which is displayed when selecting a different trigger condition with a blank units field.

**ATMS-1861:** Some of the CHART services which are not used are installed as automatic which can cause confusion or issues when either the server is restarted or verification is performed by CM (Configuration Management) of which intended services should be running. The ATMS installation scripts will be updated to install un-used services as disabled by default.

**ATMS-1891:** JWPlayer will be upgraded to match the version used by CHART Web, assuming that all functionality used by the ATMS GUI is still supported in the new version. A goal will be to continue to allow JWPlayer to operate without Internet connectivity, as is needed for lab usage.

**ATMS-1909:** The steps in the CHART ES database copy job will be performed in a transaction to avoid partial failures leaving the database in a bad state.

**ATMS-1940:** Some of the installed CHART services will be updated on the CHART Training Environment. Specifically, services which are not used will be installed as disabled, and services such as RITISEvents, RITISService and MDTATravelTimeImportService will be installed as manual for use upon necessity.

**ATMS-1942:** As part of this PR, obsolete config files for chartsys2 and chartdevappl environments will be removed from the ATMS code base. These servers are decommissioned and are not used by the CHART system in any way. Removing these config files will cut down on maintenance of dead code.

**ATMS-1959:** The script that creates the CHART export jobs in Lufft will be updated to not include special characters, such as degree symbol to the column header of the exported weather data files.

**ATMS-1963:** The build profile for the Training Servers will be updated to correctly refer to the current server names.

**ATMS-1966:** Obsolete files and directories will be removed from the ATMS code base. As part of this, unused video functionality will also be removed including: router, video

switches, bridge circuits, video routes, and command processors. Video Fabrics will still be used.

**ATMS-1967:** The ATMS GUI will keep statistics on which request actions have been invoked, how many times they were invoked, and the date/time of last usage. This will allow analysis to find code that may be obsolete. It will also help testers and developers to determine which parts of the system are most (and least) heavily used to help develop / refine a testing priority scheme for regression and/or performance testing. It may also be useful for determining priority for documentation, training, and other things.

**ATMS-1968:** In the ATMS GUI Links section under the Navigation Bar, the CHART On the Web and Lane closure Permits links are not functional in the lab environment. These links will be corrected to the appropriate functional URLs.

**ATMS-1969:** The ATMS project baseline will be updated to move the native C++ specific projects to pre-compiled library files within the CHART dependencies directory. The external customized project will be added to maintain any future updates to the native C++ libraries as needed.

**ATMS-1973:** Some of the dynamic list pages will be changed such that the user's filtering and sorting criteria will be preserved as long as they are logged in, the next time the user views the same list by clicking on the link. This should improve efficiency and reduce the annoyance of having to repeat filtering / sorting when returning to the same list.

**ATMS-1975:** A problem where old data in the TOLL\_DATA\_IMPORT table is not being deleted will be fixed.

**ATMS-1976:** Improvements to the CHART ATMS Demo will be made to simplify the installation and configuration of the application prerequisites: Microsoft SQL Server 2012, Apache Tomcat 8.0.30, Java Runtime 8.0.74, and the CHART ATMS application. The initial database will also be expanded to include specific sample data which may be used to properly demonstrate the capabilities of the CHART ATMS system.

**ATMS-1978:** Development-only functions will be added: Close All Alerts and Close All Open Traffic Events, to clear out the alerts and traffic events that can accumulate during development and testing. These functions will be enabled via a GUI properties file setting, and configured by the installer to only be available in development and lab environments. They will also require administrative-level rights as a further way of preventing them from being used in the production system.

**ATMS-1979:** Obsolete user rights will be removed from the ATMS code base. As part of this issue there are 10 unused user rights which are not displayed in the GUI, but still exist in

the code base. Removing these rights from the code base will reduce maintenance on deadcode. The following functional rights will be removed:

- SetDMSMessage
- Reset DMS
- ResetDMSGGroup
- ForceDMSPoll
- HandleUncontrolledResources
- SetHARMMessage
- TrafficEventservice
- ViewPersistentTourconfig
- SuspendResumeAllTours
- ConfigureSystemParticipants

**ATMS-2021:** All DMS models and corresponding protocols except for NTCIP and FP9500 will be removed, including: Addco, FP1001, FP2002, PCMS, Sylvia, and TS3001.

**ATMS-2022:** Relevant data will be saved to the database to justify the system's decisions regarding the activation and deactivation of triggered messages.

### **1.1.2 Scope**

The main objective of this detailed design document is to provide software developers with a framework in which to implement the requirements identified in the CHART ATMS R17 Requirements document. A matrix mapping requirements to the design is presented in Appendix A (Mapping to Requirements).

## **1.2 Project Executive Summary**

The main objective of this detailed design document is to provide software developers with a framework in which to implement the requirements identified in the CHART ATMS R17 Requirements document. The overall contents of ATMS Release 17 are summarized in Section 1.2.

### ***Design Process***

The design was created by capturing the requirements of the system in UML Use Case diagrams. Class diagrams were generated showing the high level objects that address the Use Cases. Sequence diagrams were generated to show how each piece of major functionality will be achieved. This process was iterative in nature – the creation of sequence diagrams sometimes caused re-engineering of the class diagrams, and vice versa.

### ***Design Tools***

The work products contained within this design were extracted from the Enterprise Architect design tool. Within this tool, the design is contained in the project named “chartdesign” in the folder named “CHART-ATMS-R17”.

### ***Work Products***

The final CHART ATMS Release 17 design consists of the following work products:

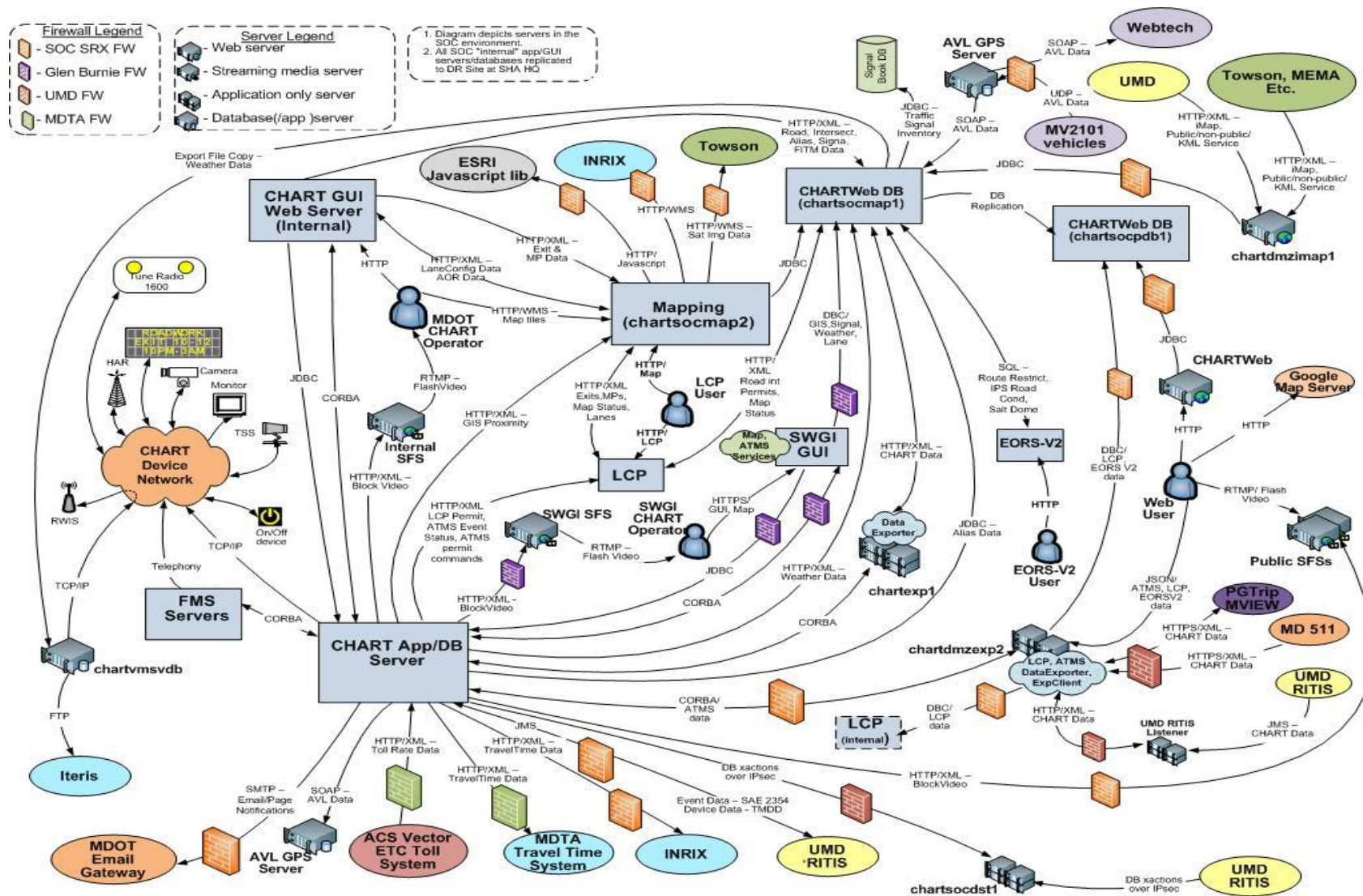
- Human-Machine Interface section which provides descriptions of the screens that are changing or being added in order to allow the user to perform the described uses.
- Use Case diagrams that capture the requirements of the system
- UML Class diagrams, showing the software objects which allow the system to accommodate the uses of the system described in the Use Case diagrams
- UML Sequence diagrams showing how the classes interact to accomplish major functions of the system

Requirement Verification Traceability Matrix that shows how this design meets the documented requirements for this feature

#### **1.2.1 System Overview**

The CHART ATMS is a set of software programs used to identify and track traffic flow disruptions, send responders to correct the disruption and notify the public using Dynamic Message Signs (DMSs) and Highway Advisory Radios (HARs), and send notifications to the media and feeding data to a live traffic web site (<http://www.traffic.maryland.gov>) and Maryland 511. The system runs on a combination of Windows 2008 Servers, connected to a statewide network of Closed Circuit Television (CCTV) cameras, overhead and portable DMSs, HARs, Traffic Sensor Systems (TSSs) (microwave traffic flow detectors), remote weather stations, and On/Off devices (electronic relay devices such as for horns and fog beacons). It is. The software is built using Java and C++ and connects to a Microsoft SQL Server database. Interprocess communications is achieved using an industry standard CORBA (Common Object Request Broker Architecture) package and web services (typically Extensible Markup Language (XML) over Hyper Text Transfer Protocol (HTTP)). A web-based Graphical User Interface (GUI) is connected to the CHART ATMS services using CORBA listeners and provides full CHART ATMS functionality to authorized users over a browser. The system provides data to interested parties via multiple systems both inside and outside the CHART Program umbrella, including CHART’s own CHARTWeb public web site and the CHART Mapping Intranet Map (both part of CHART), Maryland 511 (MD511) (not part of CHART but falls under the purview of the State Highway Administration (SHA)), and the Regional Integrated Transportation Information System (RITIS) at the University of Maryland (largely independent of SHA). This data is provided by means of two data exporter services (one internal, one external). The CHART Program provides data which is originally created via the CHART ATMS through a secure connection to the MDOT network, by providing a secure Geographic Information System export and by providing Really Simple Syndication (RSS) XML feeds on the internet. CHART ATMS and the CHART Program as a whole provide video by transcoding the statewide video and feeding it in multiple video formats through the MDOT internal network, the Statewide Government Intranet (SwGI) and the internet.

Figure 1-1 provides an overall CHART systems architecture. Figure 1-2 provides an overall CHART ATMS architecture.









A matrix mapping requirements to the design is presented in Appendix A (Mapping to Requirements).

### 1.2.2 Design Constraints

No design constraints have been identified for R17.

### 1.2.3 Future Contingencies

No future contingencies have been identified for R17.

## 1.3 Document Organization

Section 1 of this document is the introduction.

Section 2 describes the system architecture.

Section 3 describes the file and database design.

Section 4 describes the human –machine interface

Section 5 describes the detailed design with additional detailed content (detailed diagrams)

Section 6 describes the interfaces external to ATMS.

Section 7 describes the system integrity controls.

## 1.4 Points of Contact

The key members of the staff are listed below:

CSRA Operations Manager: Sam Jallad (410-872-2120)

CSRA Program Manager: Laura Nicholas (678-861-6569)

CSRA Release Manager: Gary Krebs (678-838-9935)

System Administrator: Kenny Gross (410-582-5680)

Application Delivery Manager: Chris Brennan (410-872-2124)

ATMS Development lead: Scott Dalrymple (410-872-2128)

Database Administrator: Nach Periyanan (703-508-1308)

Configuration Manager: Delena McFadden-Mello (410-872-2122)

Configuration Manager: Mike Fleming (410-872-2127)

System Test: Mike Sluder (410-872-2129)

System Test: Asha Khatri (410-872-2130)

CHART Project Manager: Dale Lineweaver (410-582-5695)

CHART Program Administrator: Rick Dye (410-582-5619)

## 1.5 Project References

. The following are the list of the relevant ATMS R17 documents. Note that not all are updated for these specific releases:

1. *CHART ATMS R16 User's Guide*, April 20, 2016, WO53-UG-001
2. *CHART System Architecture Revision 20*, May 16, 2016, WO53-DS-002 R20
3. *WO53 CHART ATMS Operations and Maintenance Guide*, May 16, 2016, WO53-UG-003
4. *CHART ATMS R16 Application Recovery Plan*, May 9, 2016, WO53-IP-001

## 1.6 Glossary

TERM	DESCRIPTION
AJAX	Asynchronous Javascript and XML
AOR	Area of Responsibility representing an area that a person, user, operations center, etc. is responsible for.
API	Application Programming Interface
ATMS	Advance Traffic Management System
CHART	Coordinated Highways Action Response Team
CORBA	Common Object Request Broker Architecture
CCTV	Closed Circuit Television
COTS	Commercial Off The Shelf [software or equipment]
CRUD	Create, Read, Update, and Delete (the four standard actions which can be performed on a database table).
DBMS	Database Management System
DMS	Dynamic Message Sign. An electronic sign used to display information to the traveling public.
DTMF	Dual Tone Multi-Frequency (touchtone telephone signaling system)
Dynamic Message Sign	An electronic sign used to provide messages to motorists.
ERD	Entity Relationship Diagram, used to show the relationship between tables in an RDBMS
FMS	Field Management System
Functional Right	A user right, granted to CHART users via Roles. Each operation on a device, including the ability to configure a device, view its sensitive information, and issue commands to the device are controlled by user rights. Users must possess the proper right to be able to perform these actions.
GB	Gigabytes
GIF	Graphic Interchange Format (picture file)
GIS	A Geographic Information System (GIS) is any system that captures, stores, analyzes, manages, and presents data that are linked to location
GUI	Graphical User Interface
HAR	Highway Advisory Radio. A radio station used to broadcast programmable messages to motorists and other travelers regarding traffic and other delays.
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
IDL	Interface Definition Language. Describes a CORBA interface.
JAXB	Java API for XML Binding
JDBC	Java Database Connectivity
JDOM	Java Document Object Model

TERM	DESCRIPTION
JNI	Java Native Interface, a means of interfacing Java programs with languages written in other languages, such as C++
JRE	Java Runtime Environment
JTS	Java Topology Suite
KB	Kilobytes
LCP	Lane Closure Permit, a permit for closure of a road for maintenance, or the system used to manage those permits.
MB	Megabytes
MSSQL	Microsoft SQL [Server], the DBMS used in CHART.
NSIS	Nullsoft Scriptable Installation System
PDF	Portable Document Format
PR	Problem Report
RDBMS	Relational DBMS
REST	Representational State Transfer
RPC	Remote Procedure Call
RV	Recreational Vehicle
SDK	Software Development Kit
SFS	Streaming Flash Server
SHA	State Highway Administration
SNMP	Simple Network Management Protocol
SOC	Statewide Operations Center
SQL	Structured Query Language
TSS	Traffic Sensor System
UCD	Use Case Diagram. Depicts a collection of Use Cases.
UML	Unified Modeling Language
XML	Extensible Markup Language

## 2SYSTEM ARCHITECTURE

The sections below discuss specific elements of the architecture and software components that are created, changed, or used in CHART ATMS Release 17.

### 2.1 System Hardware Architecture

CHART ATMS Release 17 features do not impact the hardware architecture of the CHART ATMS system.

### 2.2 System Software Architecture

CHART ATMS uses the Common Object Request Broker Architecture (CORBA) as the base architecture, with custom built software objects made available on the network allowing their data to be accessed via well-defined CORBA interfaces. Communications to remote devices use the Field Management Server (FMS) architecture. Newer external interfaces such as the User Management web service, Data Exporter, and GIS service employ a web services architecture combining an HTTP request/response structure to pass XML messages.

Except where noted in the subsections below, CHART ATMS Release 17 features do not impact the software architecture of the CHART ATMS.

#### 2.2.1 COTS Products

CHART ATMS uses numerous COTS products for both run-time and development. Table 2-1 contains existing and new COTS products.

*Table 2-1. ATMS COTS Products*

Product Name	Description
Adobe Flex SDK	CHART uses the Flex SDK 4.6 to provide the Flex compiler, the standard Flex libraries, and examples for building Flex applications used by the CHART ATMS GUI.
Apache ActiveMQ	CHART uses this to connect to RITIS JMS queues.
Apache Commons Lang3	CHART uses commons-lang3-3.3.2 for various string utility methods provided by this library. For example, the RandomStringUtils class is used to generate random passwords for password reset requests.
Apache Jakarta Ant	CHART uses Apache Jakarta Ant 1.9.6 to build CHART applications and deployment jars.
Apache PDFBox	CHART uses this library for generating PDF documents from ATMS web pages (e.g., the list of contacts)
Apache Tomcat	CHART uses Apache Tomcat 8.0.30 as the GUI web server.
Apache XML-RPC	CHART uses the apache xmlrpc java library 3.1.2 protocol that uses XML over HTTP to implement remote procedure calls. The video Flash streaming “red button” (“kill switch”) API uses XML over HTTP remote procedure calls.
Bison/Flex	CHART uses Bison and Flex as part of the process of compiling binary macro files used for performing camera menu operations on Vicon Surveyor VFT cameras.
bsn.autosuggest	The event resource search feature and the EORS integration feature use version 2.1.3 of the bsn.autosuggest JavaScript code from brandspankingnew.net. This tool is freely available and is included as source code in the CHART GUI. It provides a simple JavaScript tool that can be associated with a text entry field. It uses AJAX

Product Name	Description
	to provide search results / suggestions as the user types.
CoreTec Decoder Control	CHART uses a CoreTec supplied decoder control API for commanding CoreTec decoders.
Dialogic API	CHART uses the Dialogic API for sending and receiving Dual Tone Multi Frequency (DTMF) tones for HAR communications.
GIF89 Encoder	Utility classes that can create .gif files with optional animation. This utility is used for the creation of DMS True Display windows.
Java	The ATMS is built with and runs under Java 1.8.0_74.
JAXB	CHART uses the jaxb java library to automate the tedious task of hand-coding field-by-field XML translation and validation for exported data.
JDOM	CHART uses JDOM b7 (beta-7) dated 2001-07-07. JDOM provides a way to represent an XML document for easy and efficient reading, manipulation, and writing.
JacORB	CHART uses a compiled, patched version of JacORB 2.3.1. The JacORB source code, including the patched code, is kept in the CHART source repository.
JavaMail API	The CHART Notification Service uses the JavaMail API 1.4.4, an optional Java package which provides SMTP e-mail support.
Java Run-Time (JRE)	CHART uses 1.8.0_74 (32-bit needed for ATMS Services; 64-bit for Tomcat if > 1.5 GB heap size needed).
JavaService	CHART uses JavaService to install the server side Java software components as Windows services.
JAXEN	CHART uses JAXEN 1.0-beta-8 dated 2002-01-09. The Jaxen project is a Java XPath Engine. Jaxen is a universal object model walker, capable of evaluating XPath expressions across multiple models.
JoeSNMP	CHART uses JoeSNMP version 0.2.6 dated 2001-11-11. JoeSNMP is a Java based implementation of the SNMP protocol. CHART uses for commanding iMPath MPEG-2 decoders and for communications with NTCIP DMSs.
JSON-simple	CHART uses the JSON-simple java library to encode/decode strings that use JSON (JavaScript Object Notation).
JTS	CHART uses the Java Topology Suite (JTS) version 1.8.0 for geographical utility classes.
JWPlayer	CHART ATMS GUI uses JWPlayer version 7.3.6 to display streaming video.
Log4J	CHART uses the log4J version 1.2.15 for logging purposes.
Microsoft Visual Studio	CHART uses Visual Studio 2012 to build native JNI DLLs and executables.
NSIS	CHART uses the Nullsoft Scriptable Installation System (NSIS), version 2.45, as the server side installation package.
NeoSpeech Text To Speech	For text-to-speech (TTS) conversion CHART uses NeoSpeech TTS version 3.10.7.
OpenLayers	CHART ATMS GUI uses the OpenLayers JavaScript API 2.13.1 ( <a href="http://openlayers.org/">http://openlayers.org/</a> ) in order to render interactive maps without relying on vendor specific software. OpenLayers is an open source product released under a BSD style license which can be found at ( <a href="http://svn.openlayers.org/trunk/openlayers/license.txt">http://svn.openlayers.org/trunk/openlayers/license.txt</a> ).
O'Reilly Servlet	Provides classes that allow the CHART GUI to handle file uploads via multi-part form submission.
Prototype Javascript Library	The CHART ATMS GUI uses the Prototype JavaScript library, version 1.7.2, a cross-browser compatible JavaScript library provides many features (including easy Ajax support).
SAXPath	CHART uses SAXPath 1.0-beta-6 dated 2001-09-27. SAXPath is an event-based API for XPath parsers, that is, for parsers which parse XPath expressions.

Product Name	Description
MSSQL Server	CHART uses MS SQLServer (2008 R2) as its database and uses the MS SQL Server JDBC libraries (sqljdbc4.jar) for all database transactions.
SQLServer JDBC Driver	CHART uses this driver to lookup GIS related data and also to store Location Aliases in SQL Server databases.
Velocity Template Engine	Provides classes that CHART GUI uses in order to create dynamic web pages using velocity templates, CHART uses Velocity version 1.6.1 and tools version 1.4.

### 2.2.2 Component Deployment

The diagram below describes the expected deployment of ATMS components.

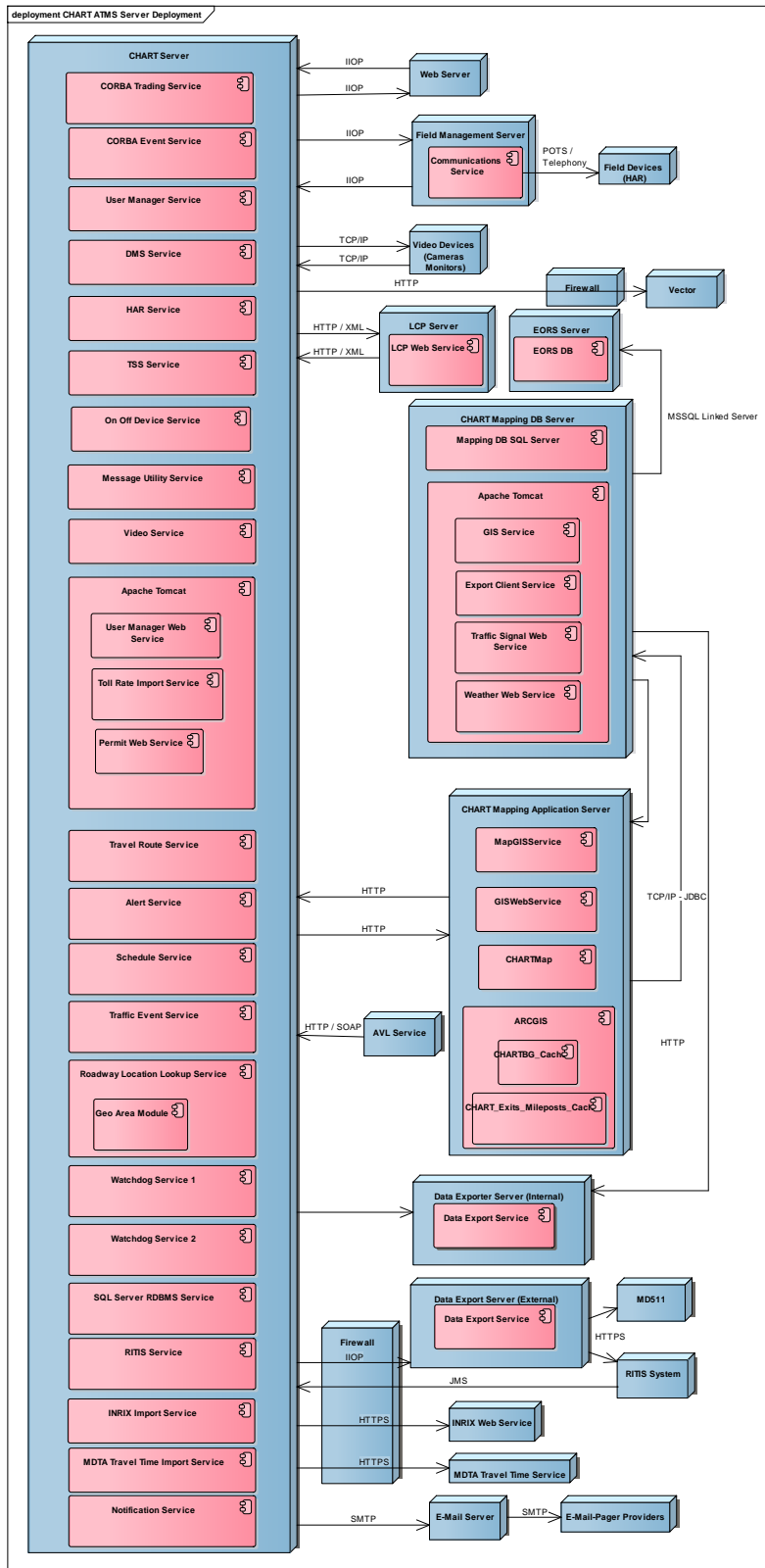
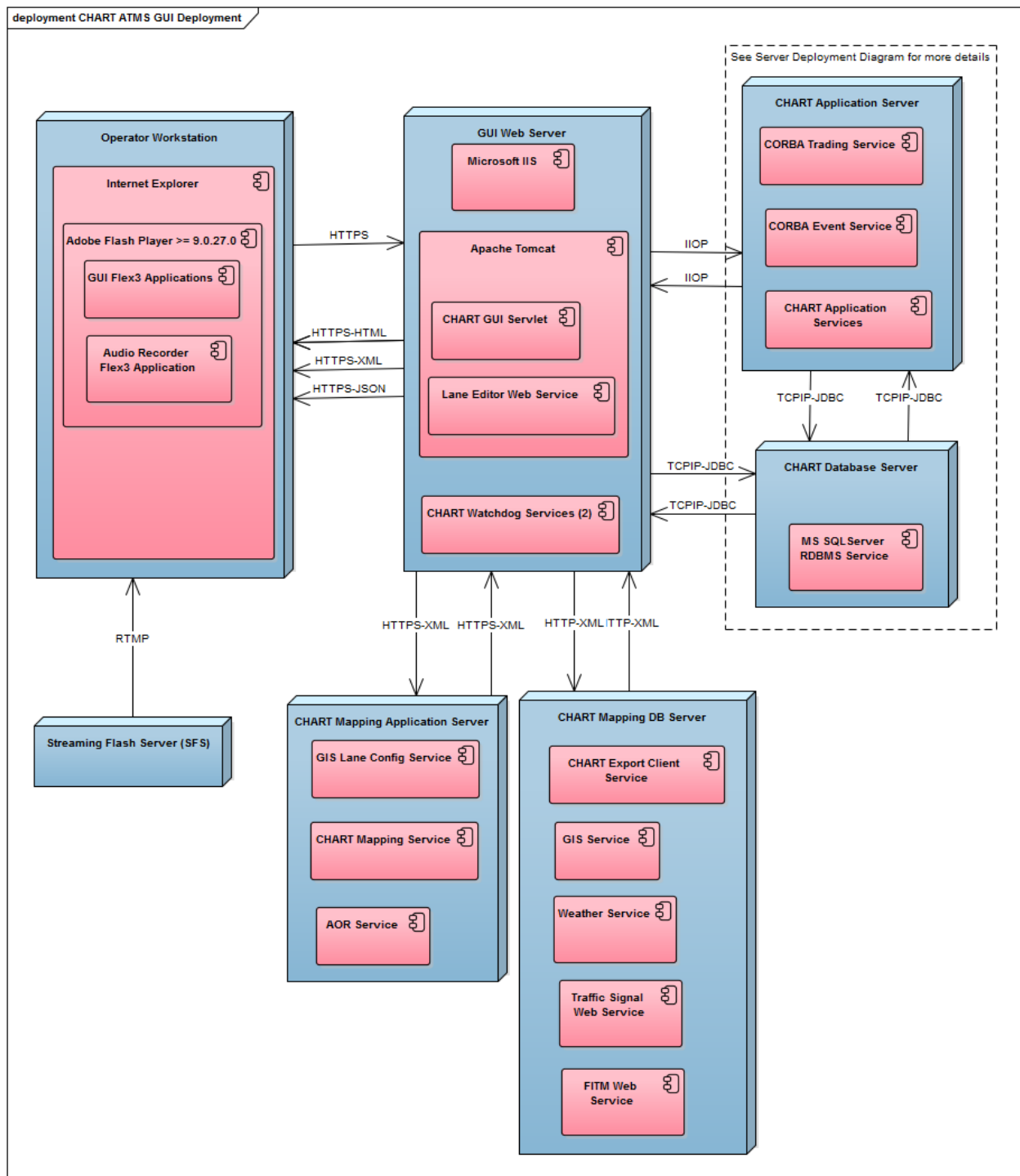


Figure 2-1. R17 Server Deployment



**Figure 2-2. R17 GUI Deployment**

### 2.2.3 Internal Interfaces

This section describes the internal interfaces added or modified in Release 17 of the CHART ATMS system.



1. ATMS-1239 adds a method to the Chart2DMSFactory for setting comm loss timeouts for multiple DMSs.
2. ATMS-1966 removes all video router, switch, bridge circuit, and video route functionality from the IDL. A new VideoFabricFactory interface is added, and supporting CORBA event and event channel types, as the VideoFabrics will be split out from the VideoSwitchFactory.

### **2.3 Internal Communications Architecture**

The overall communications architecture of ATMS is depicted in Figure 1-2. There are no internal communications architecture changes for ATMS R17.

### 3 FILE AND DATABASE DESIGN

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The CHART ATMS stores most of its data in a non-spatial MS SQL Server database. Additionally, location aliases are stored in a spatial SQL Server database. Some data is stored in flat files on the CHART servers.

This section describes all of these types of data.

#### 3.1 Database Management System Files

CHART ATMS Release 17 is tested and delivered with the fielded MS SQL Server version.

##### 3.1.1 ATMS

CHART ATMS Release 17 is tested and delivered with the fielded MS SQL Server version.

###### 3.1.1.1 Overview

An overview of the changes made to the CHART ATMS database design for Release 17 features are described below.

###### 3.1.1.1.1 ATMS-1239 Create a Capability to set Comm Loss Timeouts for Multiple DMSs

The changes for this PR use the existing SYSTEM\_PROFILE table to store the comm loss timeout backup records. There are no table design changes.

###### 3.1.1.1.2 ATMS-1966 Remove obsolete directories / files from the ATMS codebase

The changes for this PR remove the following tables from the database: BRIDGE\_CIRCUIT\_STATUS, BRIDGE\_CIRCUIT, VIDEO\_SWITCH\_CONNECTION, VIDEO\_SWITCH\_STATUS, VIDEO\_SWITCH, V1500HOST, V1500KEYPAD, and COMMAND\_PROCESSOR\_CONNECTION. Views associated with these tables will also be dropped. The MONITOR\_GROUP table will have the PRIORITY and GUARANTEED\_NUM\_ROUTES fields dropped.

###### 3.1.1.1.3 ATMS-1967 Keep track of stats / report of which GUI actions have been invoked

The changes for this PR add a GUI\_ACTION\_USAGE table to the database, which will have on the order of 1000 rows (one per registered action).

###### 3.1.1.1.4 ATMS-1979 Remove obsolete user rights

Several obsolete user functional rights will be removed from the database for this PR. There are no table design changes.

#### **3.1.1.1.5 ATMS-2022 Log/archive auto weather message data to explain why message was posted, or why not**

This PR adds 8 tables for the logging of information related to Triggers and DMS Triggered Messages.

#### **3.1.1.2 Database Architecture**

Except as noted, CHART ATMS Release 17 features do not impact the overall architecture of the CHART ATMS database.

#### **3.1.1.2.1 Logical Design**

##### **3.1.1.2.1.1 CHART Live Database Entity Relationship Diagram (ERD)**

The CHART ATMS CHART\_Live Database entity relationship diagram for R16 is shown below in the 21 figures that follow, in Figure 2-5 through Figure 2-25. Figure 2-5 is a visual table of contents into the remaining figures. The remaining figures should be mentally arranged into a grid five images wide (numbered 1-5) and five images tall (numbered 0-4), if desired to follow tables that had to be split across pages and connector lines which transverse between pages. Figure 2-6 is in the upper left, with Figure 2-7 through 2-10 to the right, with Figure 2-11 starting the second row. Note that some figures would be completely blank, and are not included, as shown in the visual table of contents in Figure 2-5. The Table Definition Report sections that follow describe the changes that are made for R16.

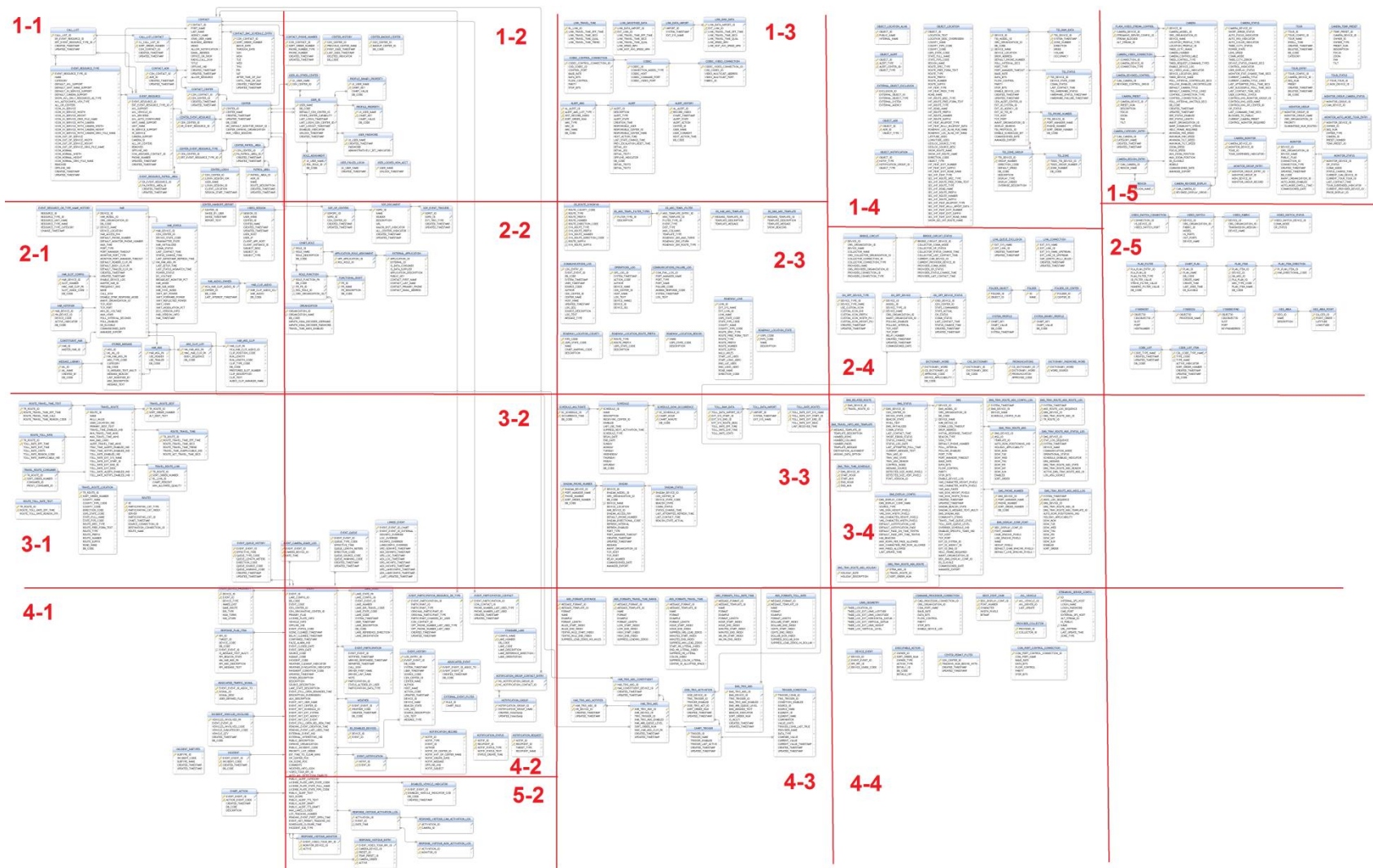


Figure 3-1. CHART\_Live ERD, Visual Table of Contents

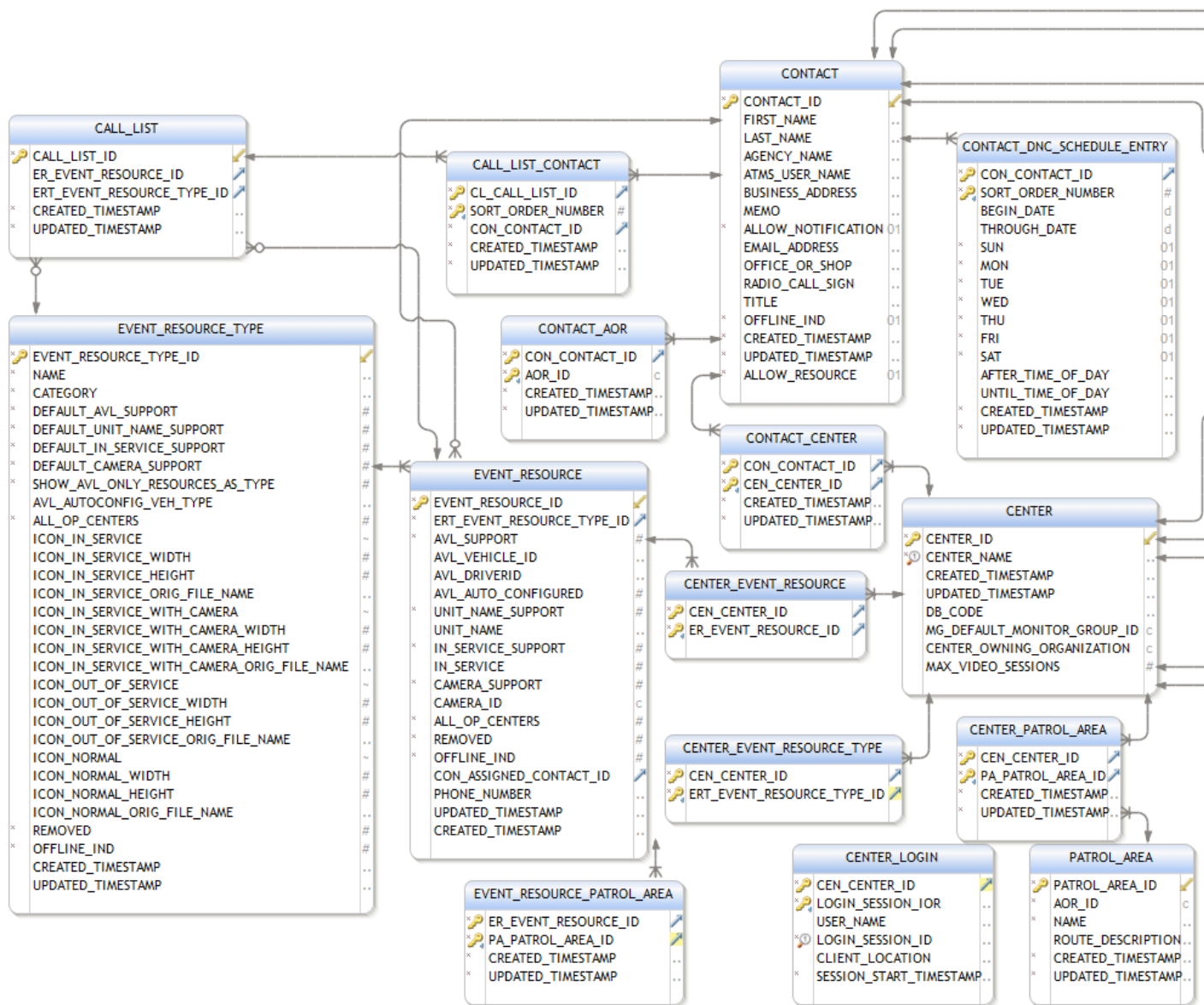


Figure 3-2. CHART\_Live ERD, Page 1-1

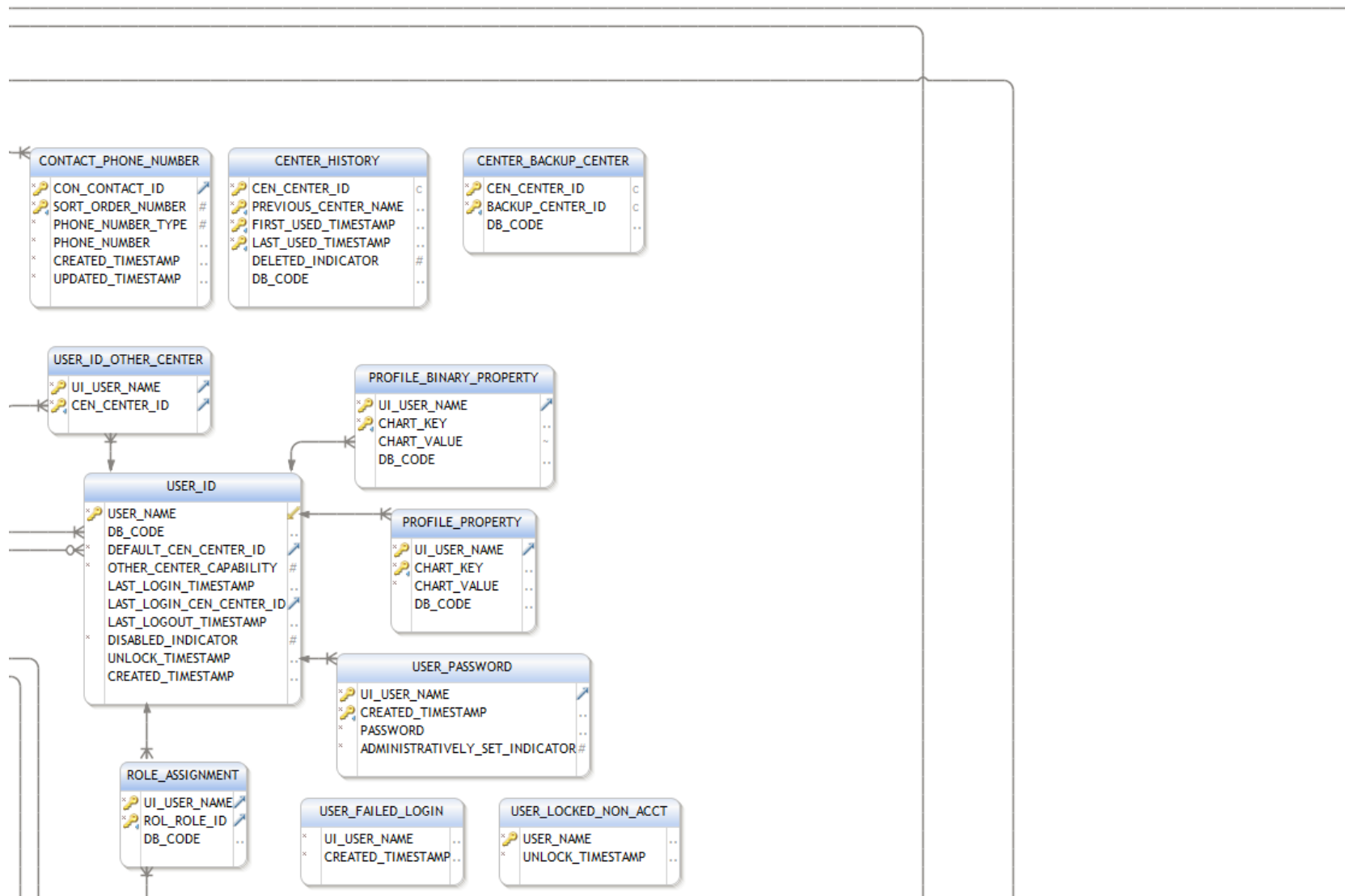


Figure 3-3. CHART\_Live ERD, Page 1-2

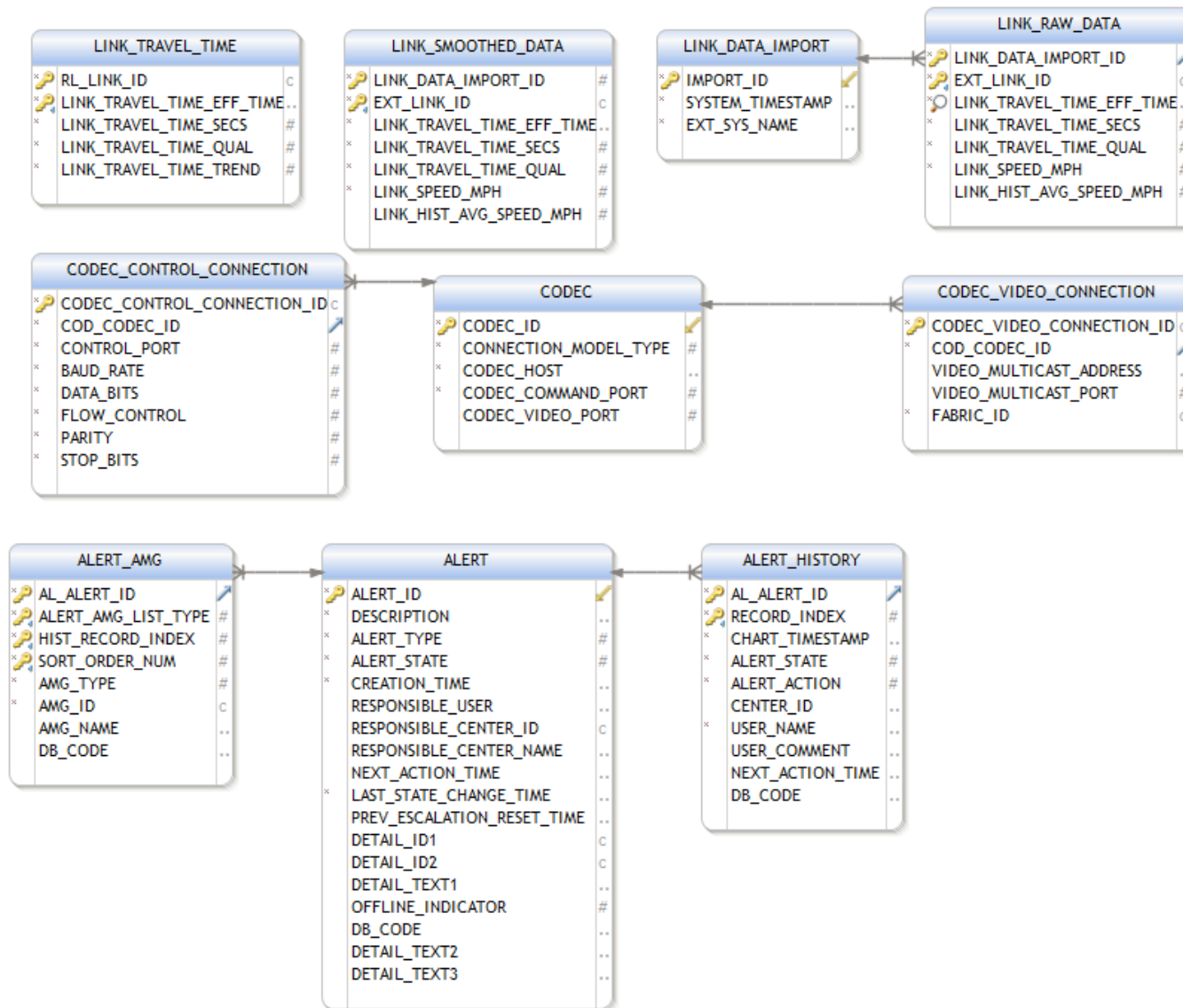


Figure 3-4. CHART\_Live ERD, Page 1-3

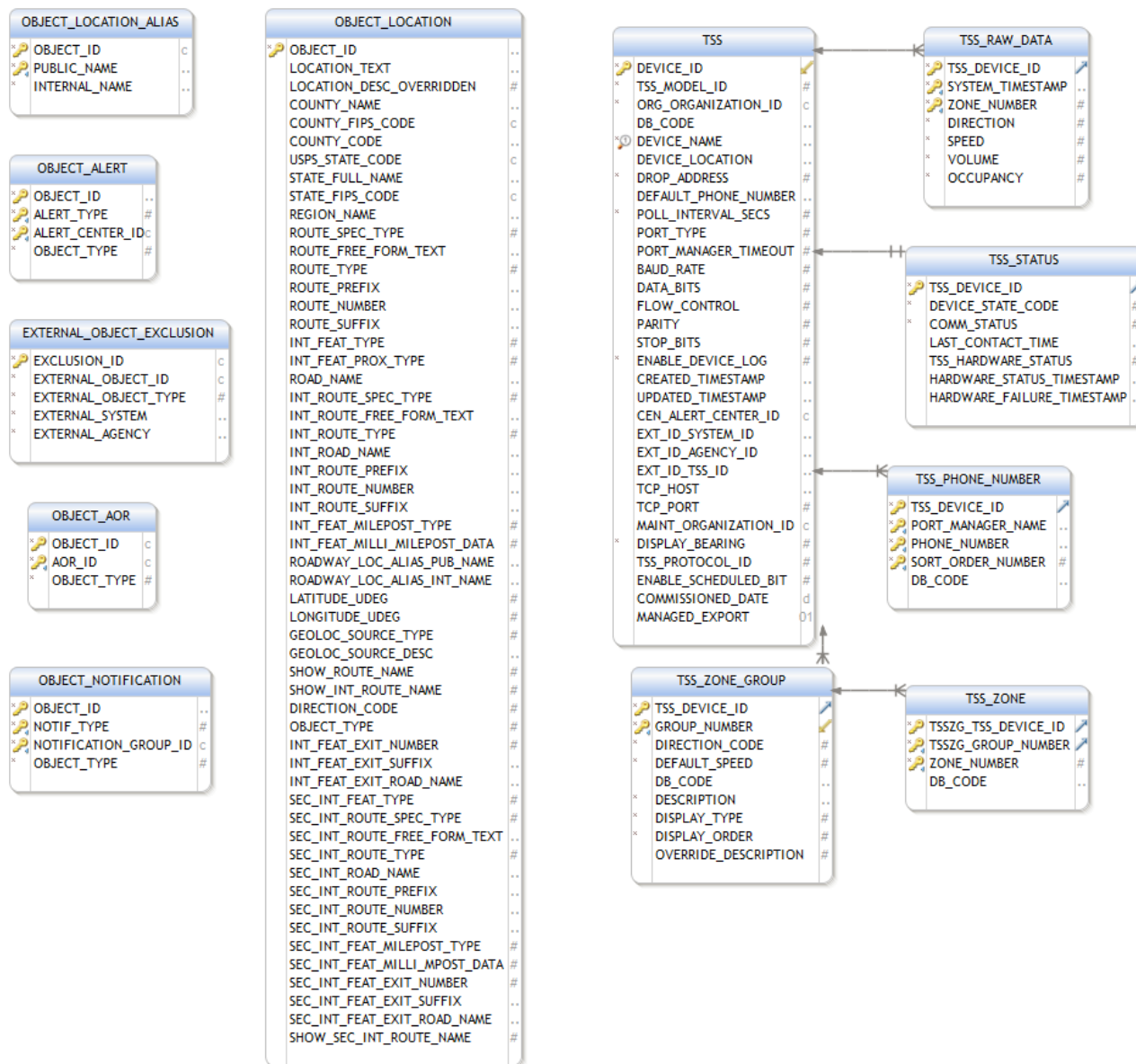


Figure 3-5. CHART\_Live ERD, Page 1-4



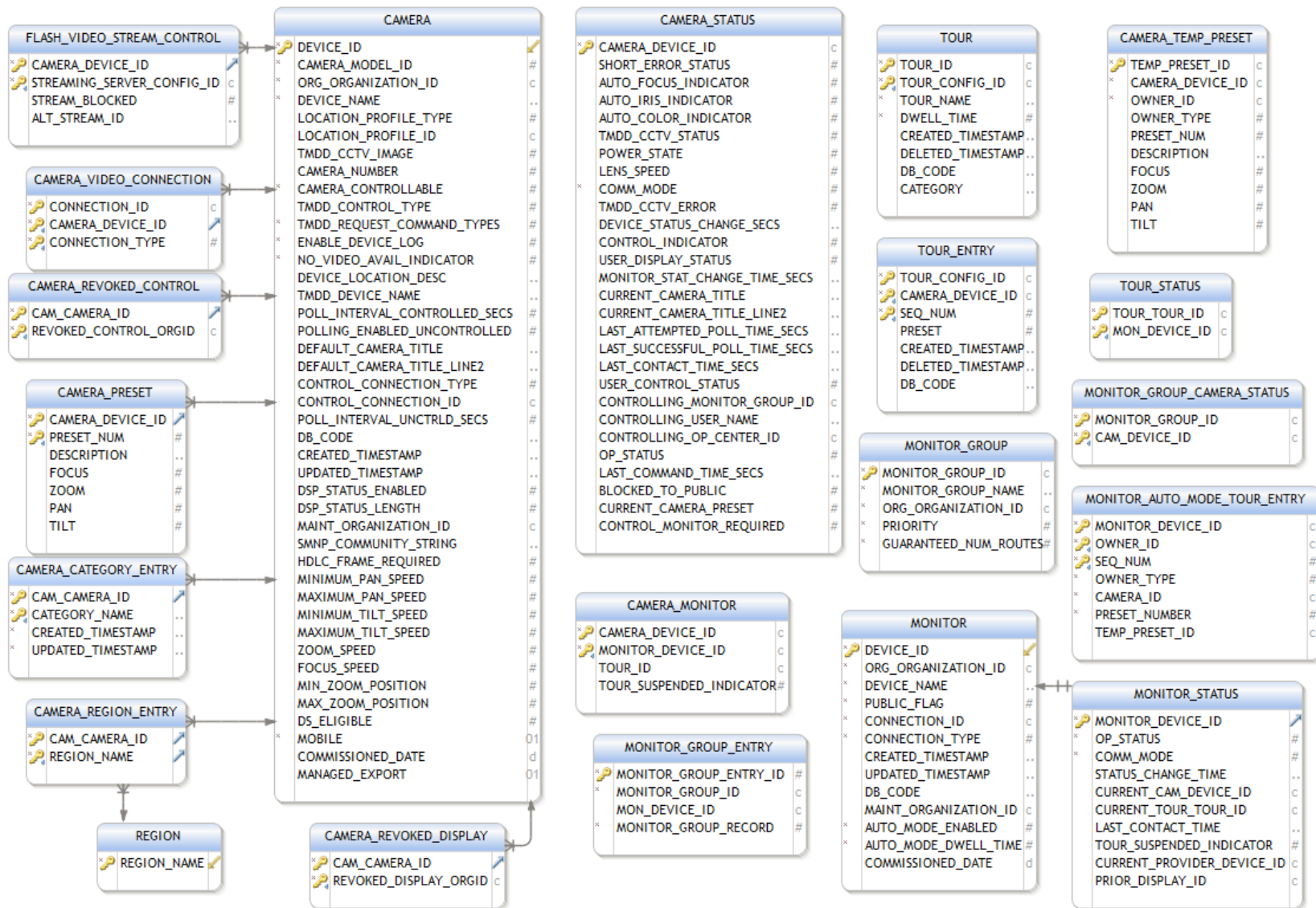


Figure 3-6. CHART\_Live ERD, Page 1-5

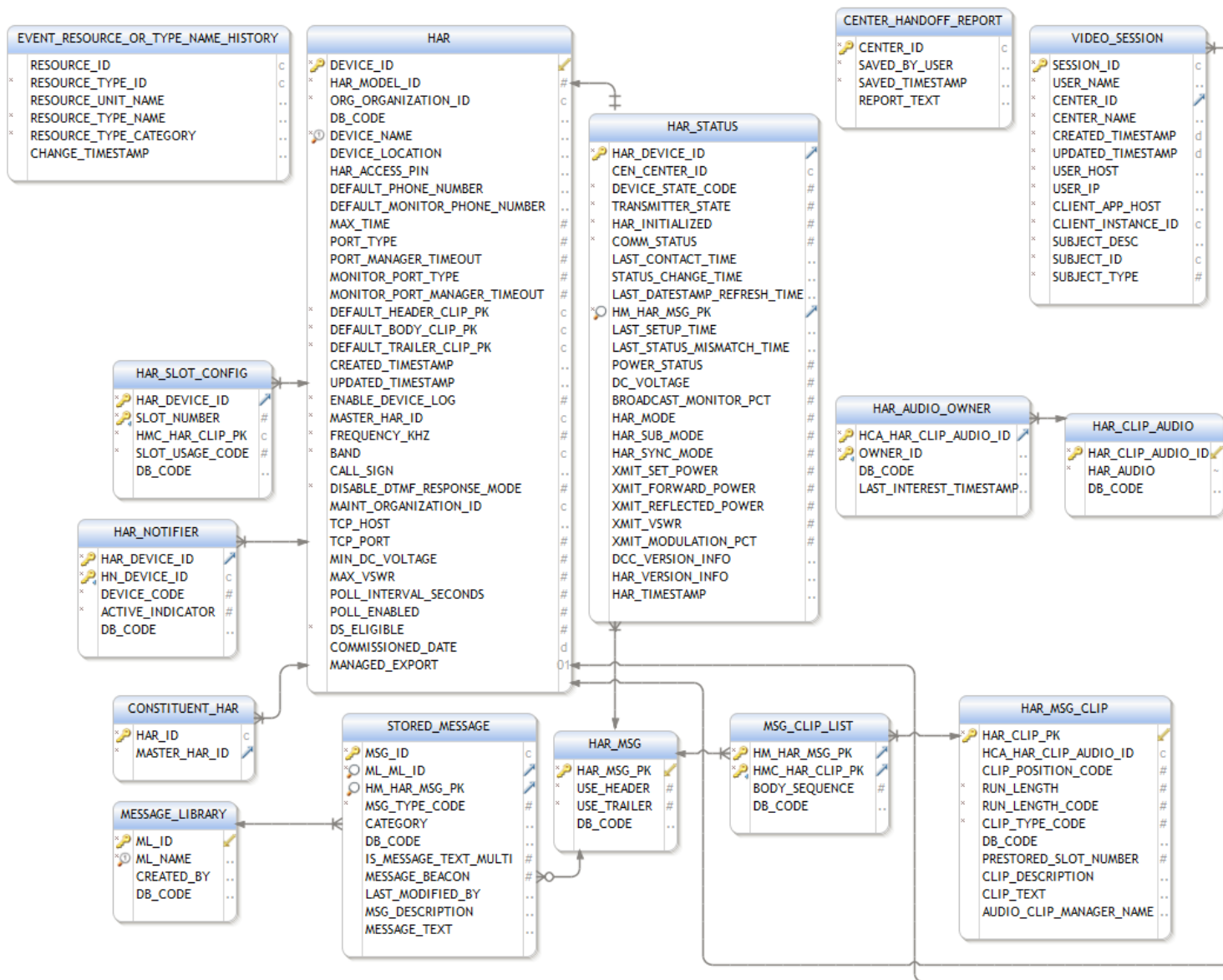


Figure 3-7. CHART\_Live ERD, Page 2-1

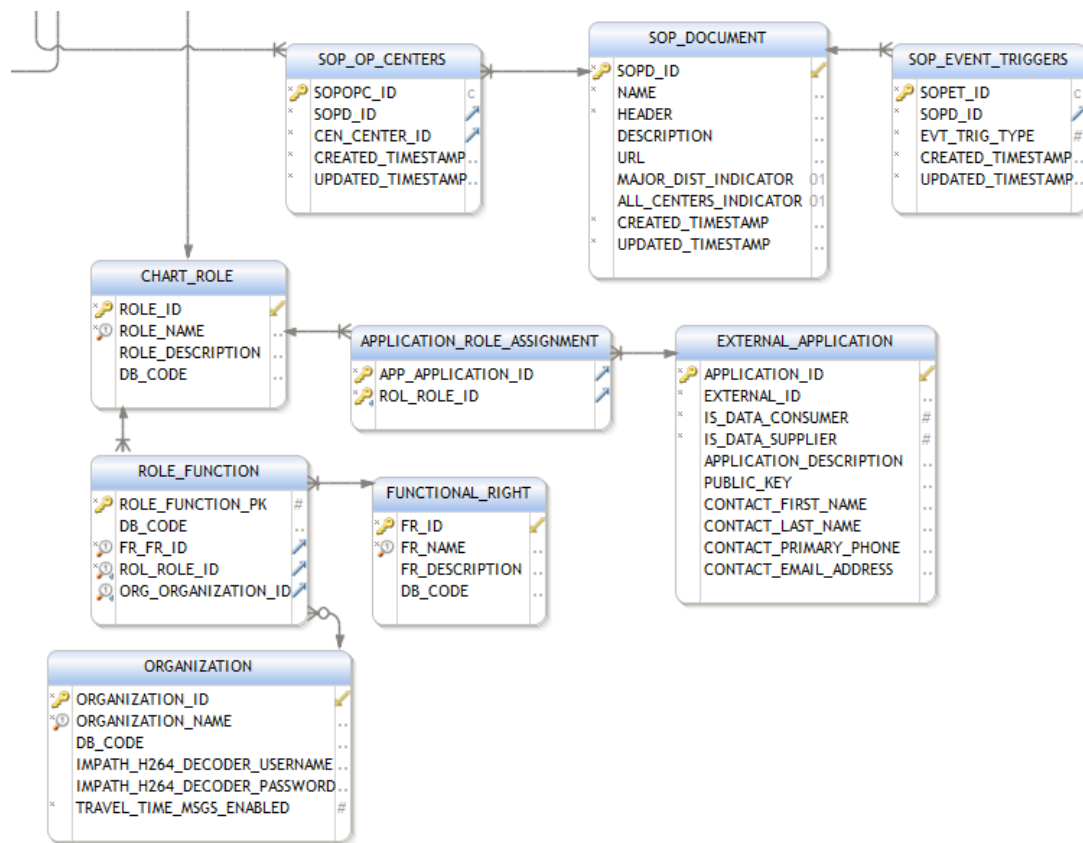


Figure 3-8. CHART\_Live ERD, Page 2-2

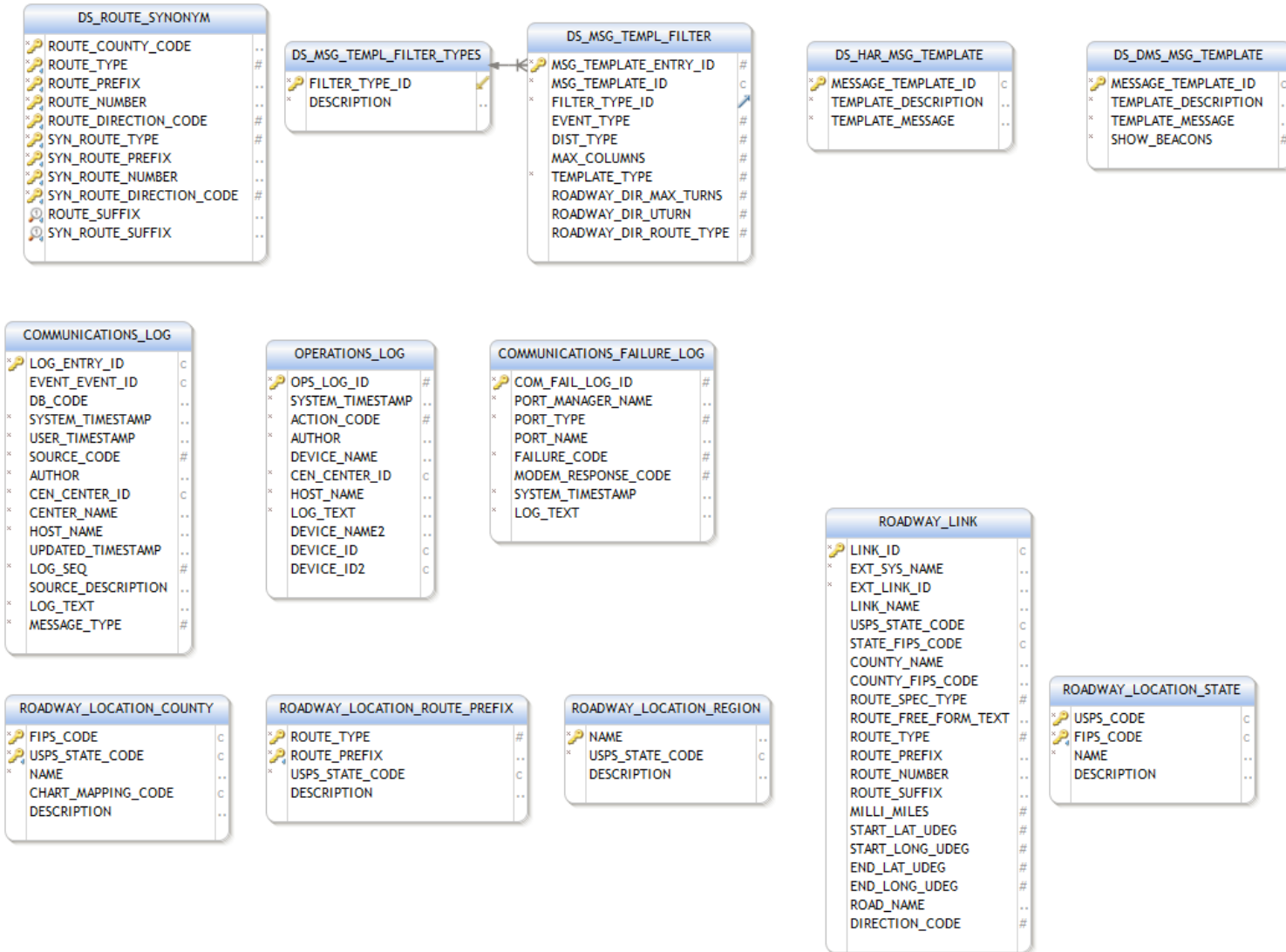


Figure 3-9. CHART\_Live ERD, Page 2-3

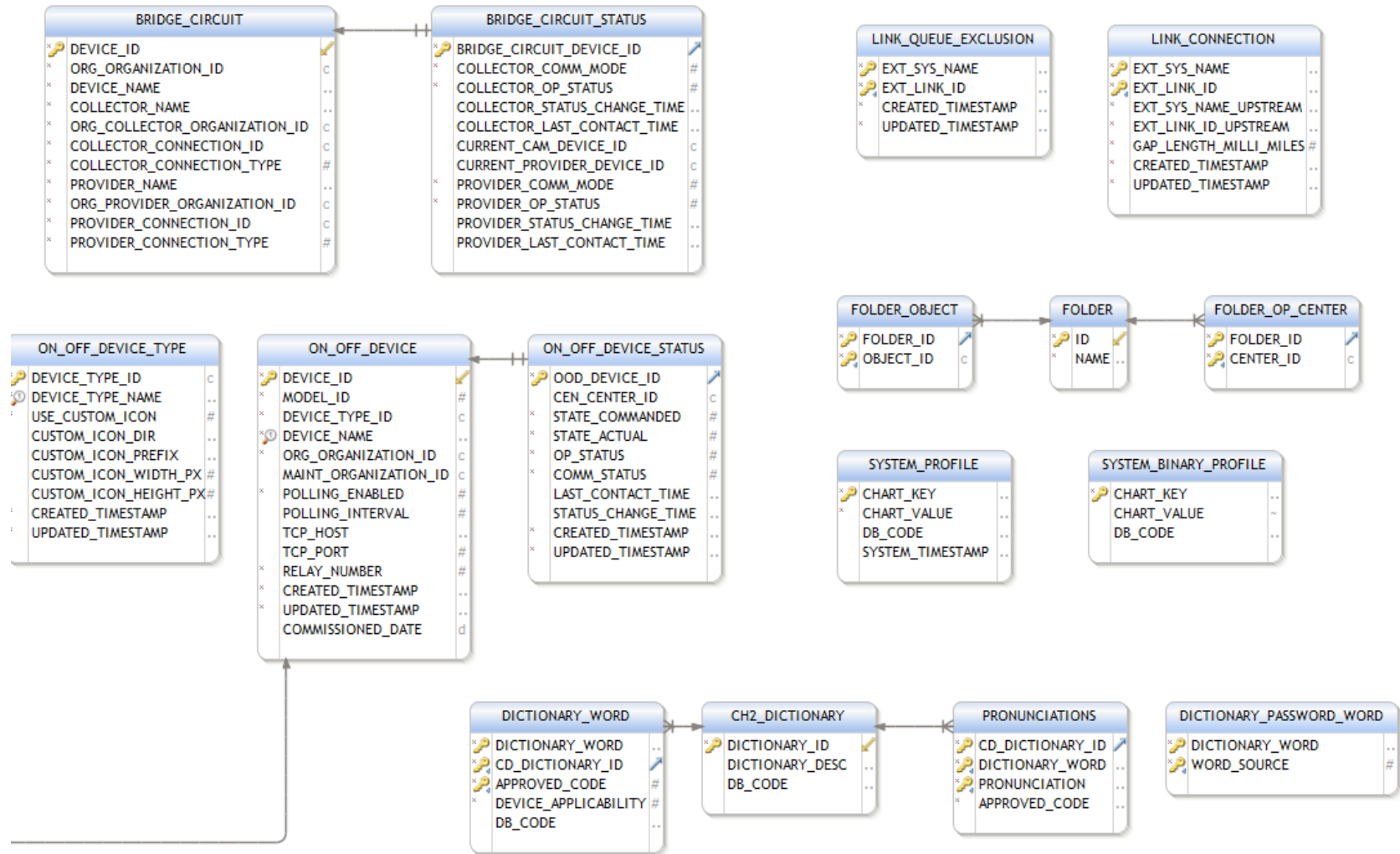


Figure 3-10. CHART\_Live ERD, Page 2-4

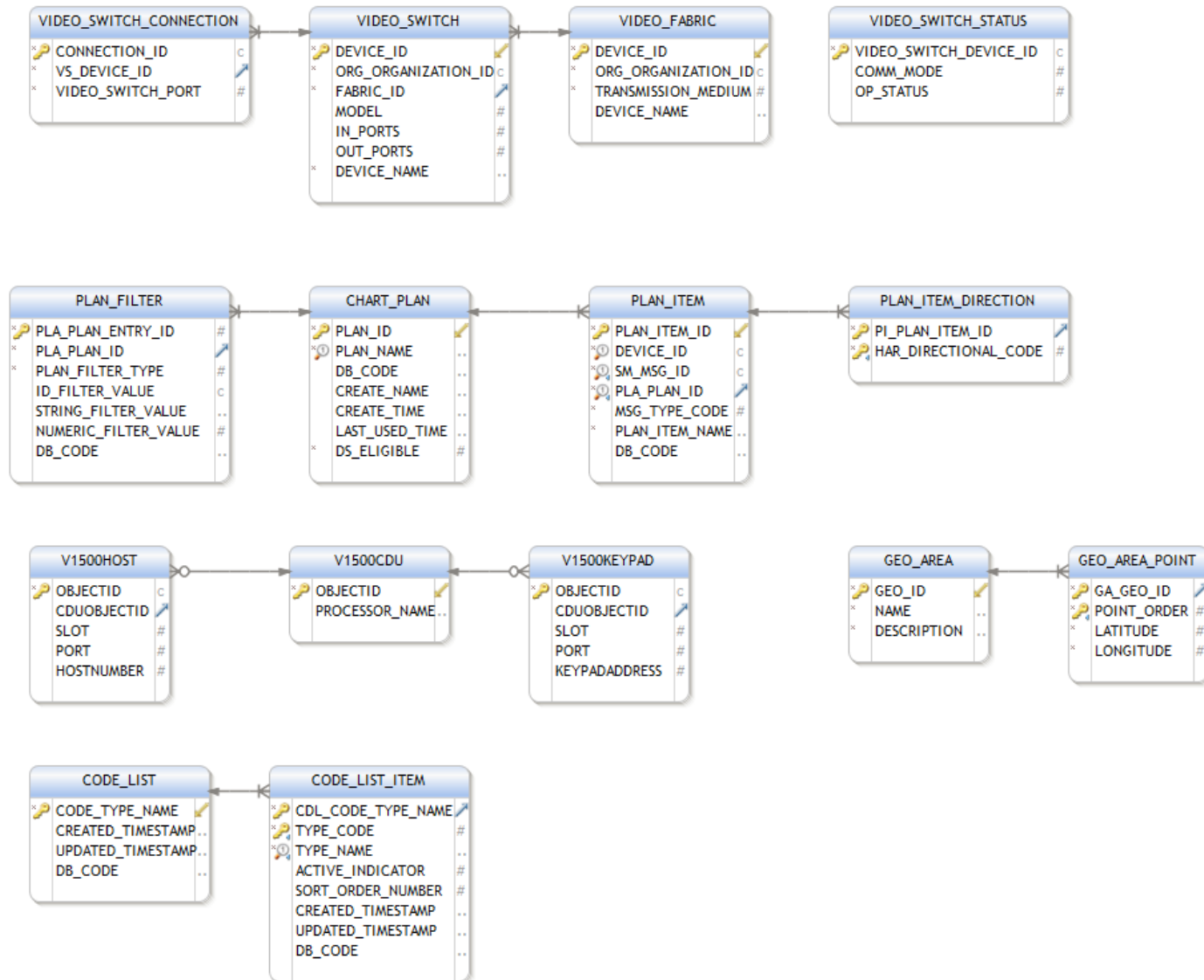


Figure 3-11. CHART\_Live ERD, Page 2-5

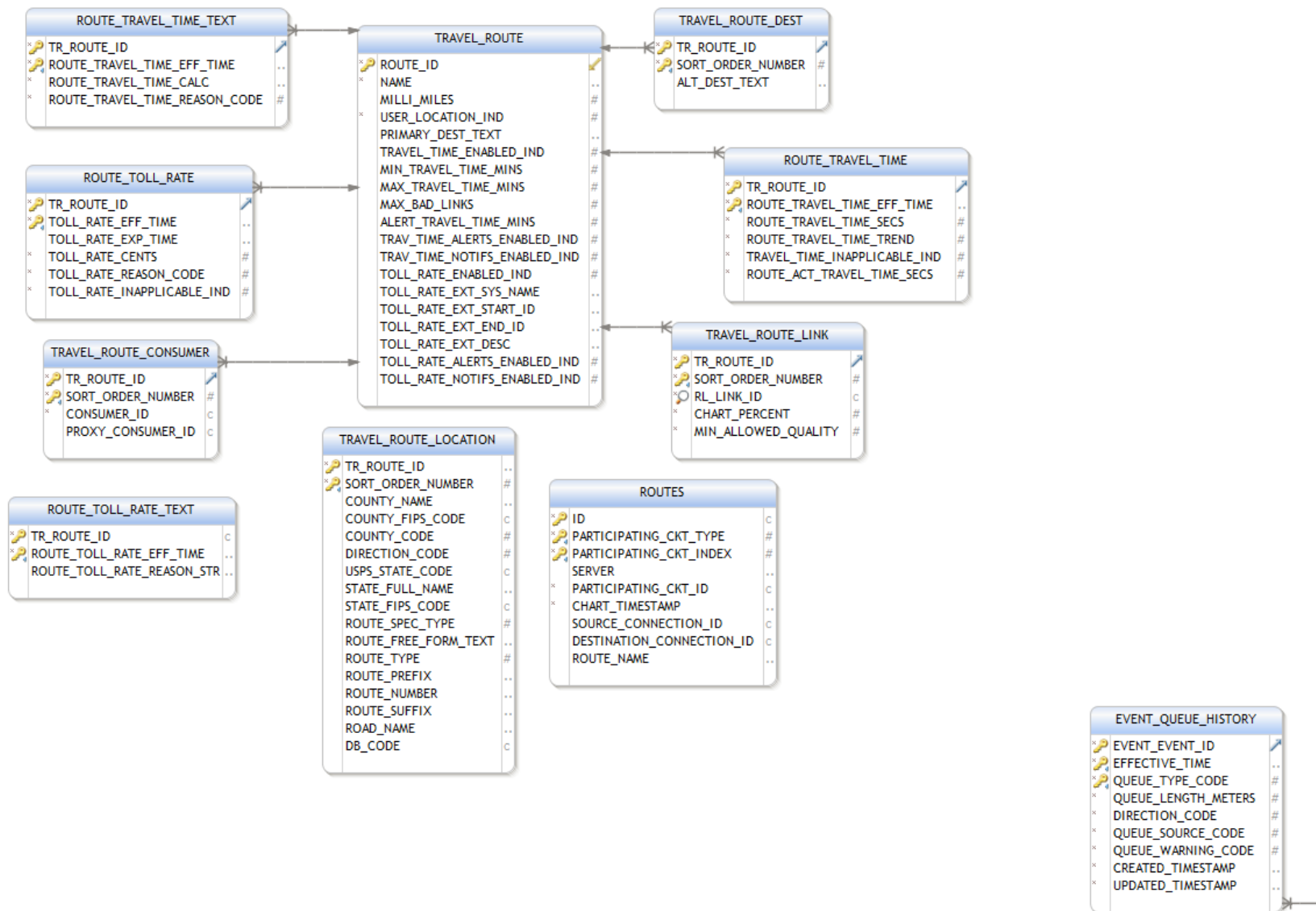
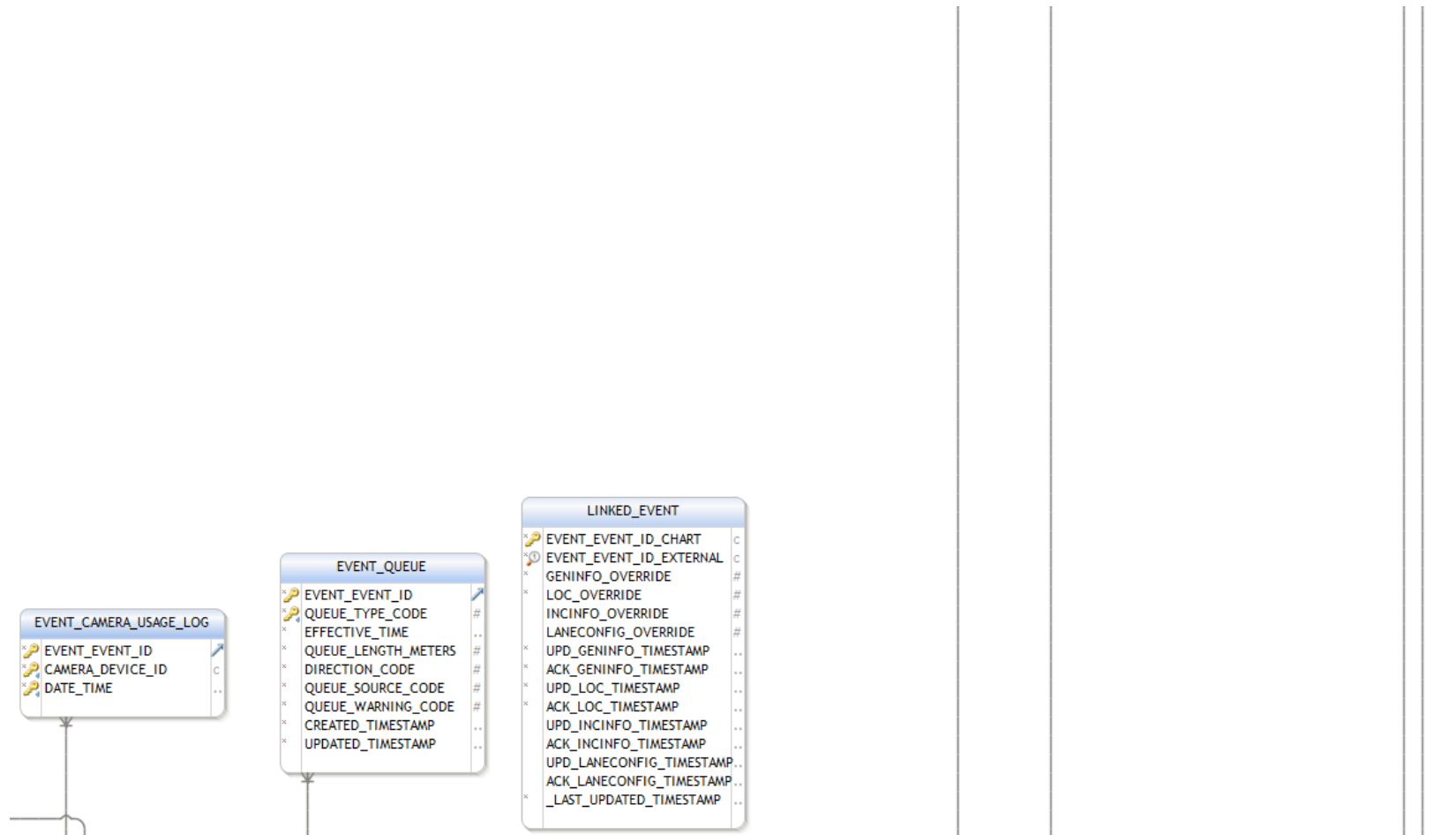


Figure 3-12. CHART\_Live ERD, Page 3-1



**Figure 3-13. CHART\_Live ERD, Page 3-2**



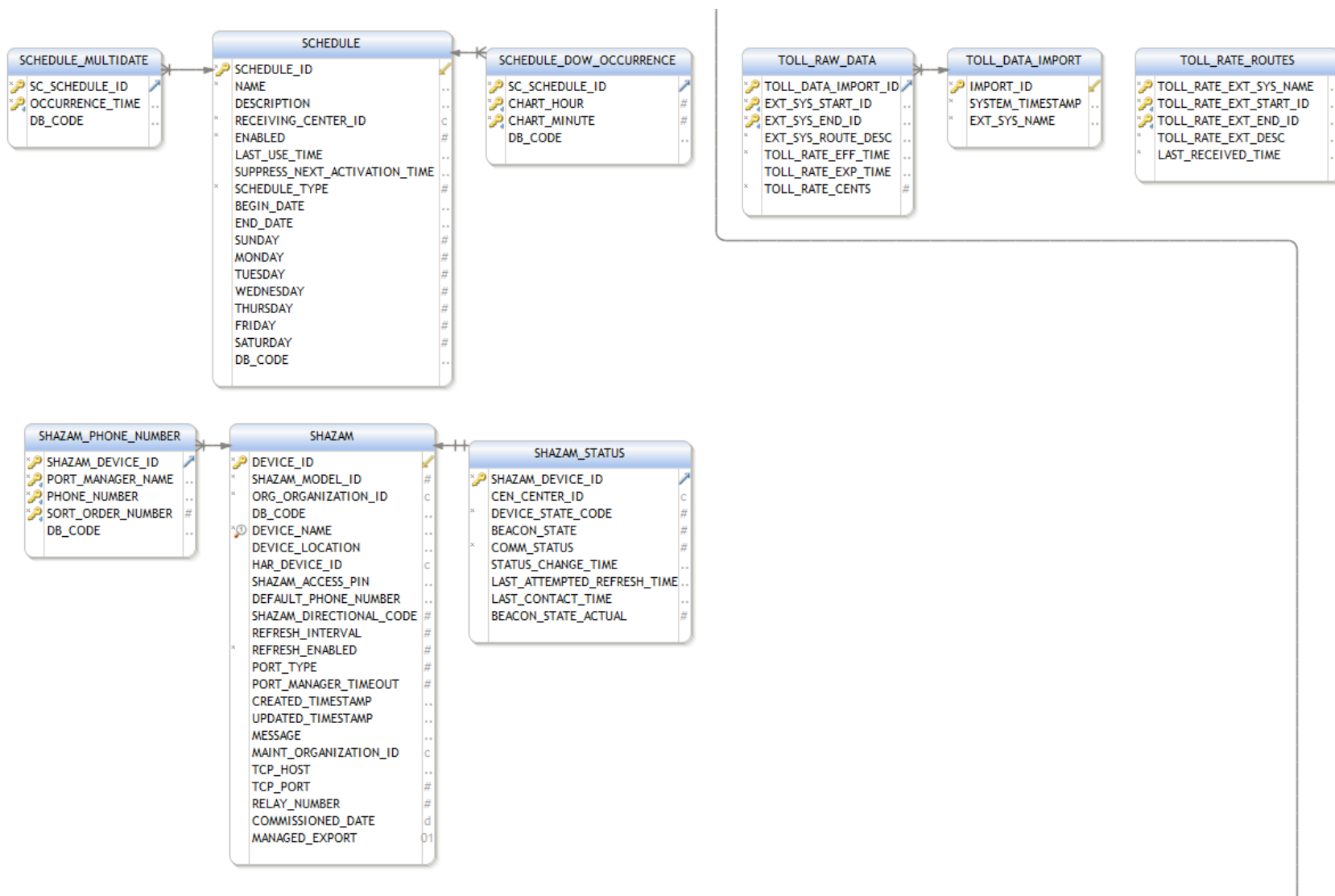


Figure 3-14. CHART\_Live ERD, Page 3-3

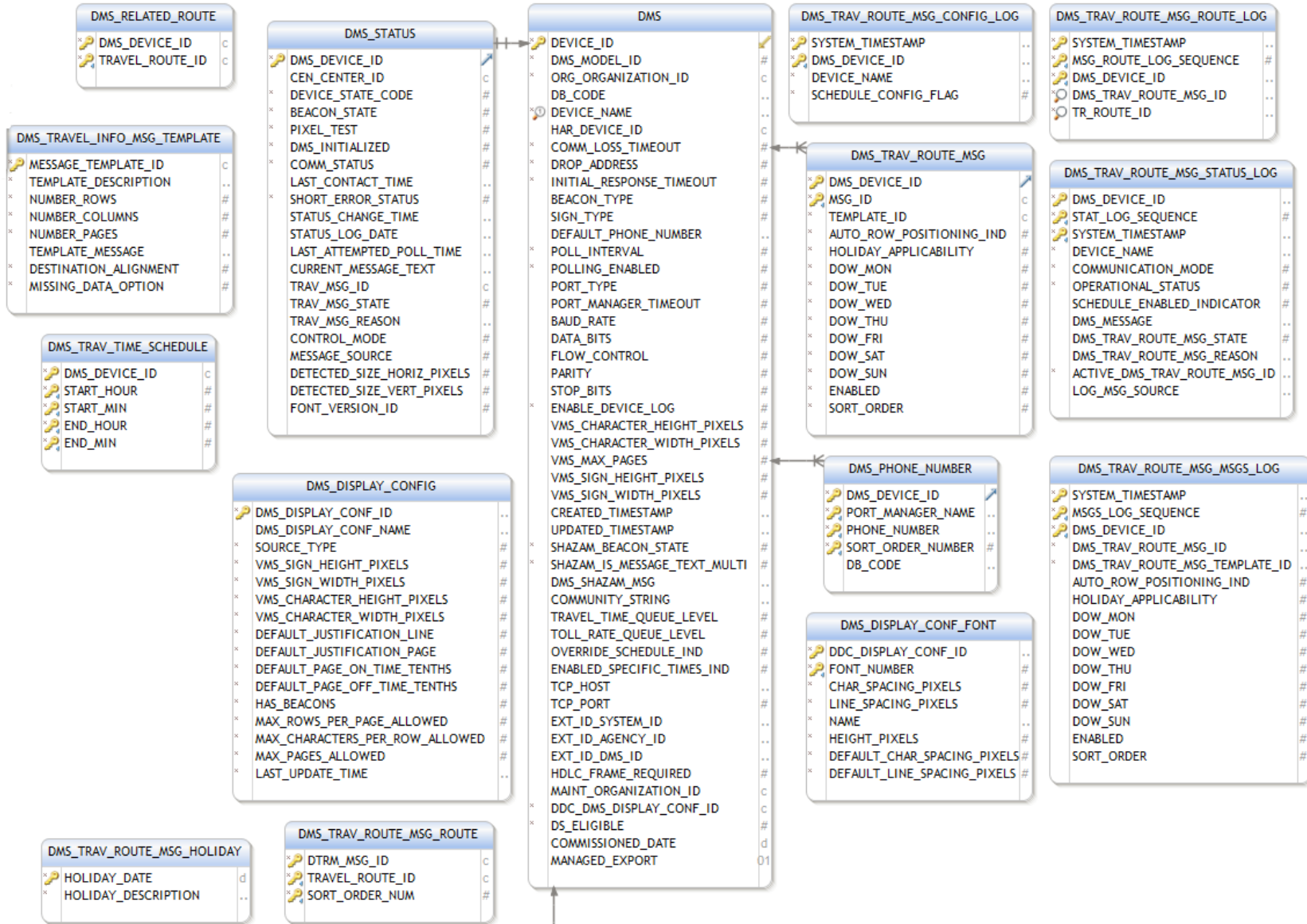
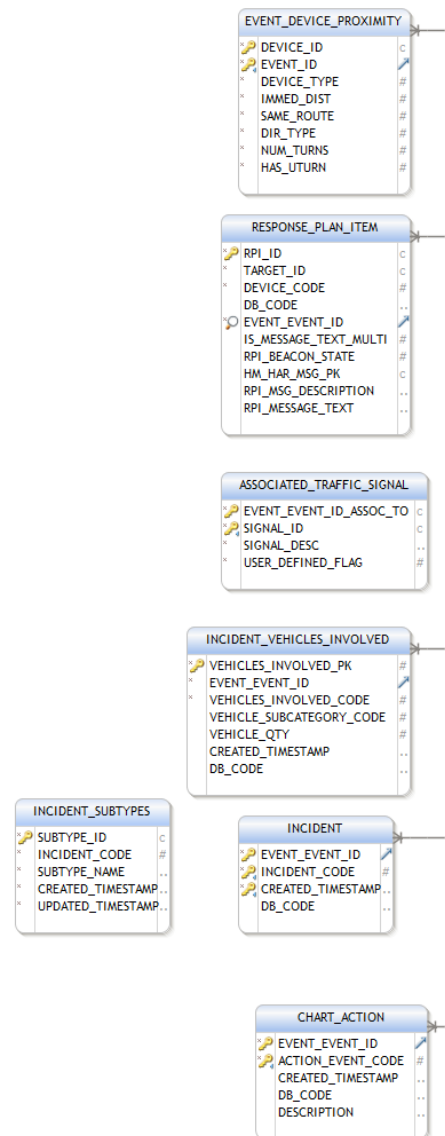


Figure 3-15. CHART\_Live ERD, Page 3-4



**Figure 3-20. CHART\_Live ERD, Page 4-1**

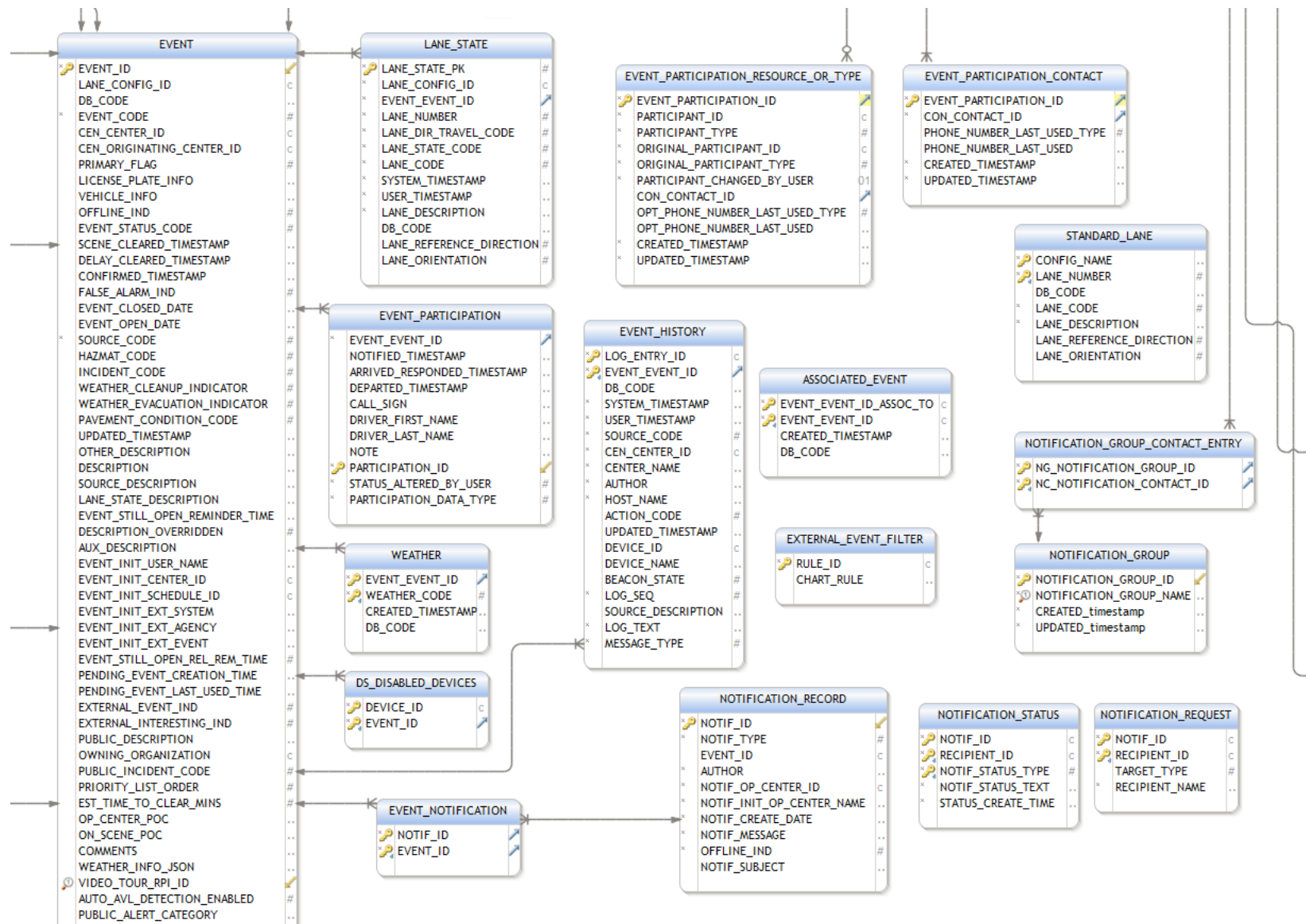


Figure 3-16. CHART\_Live ERD, Page 4-2

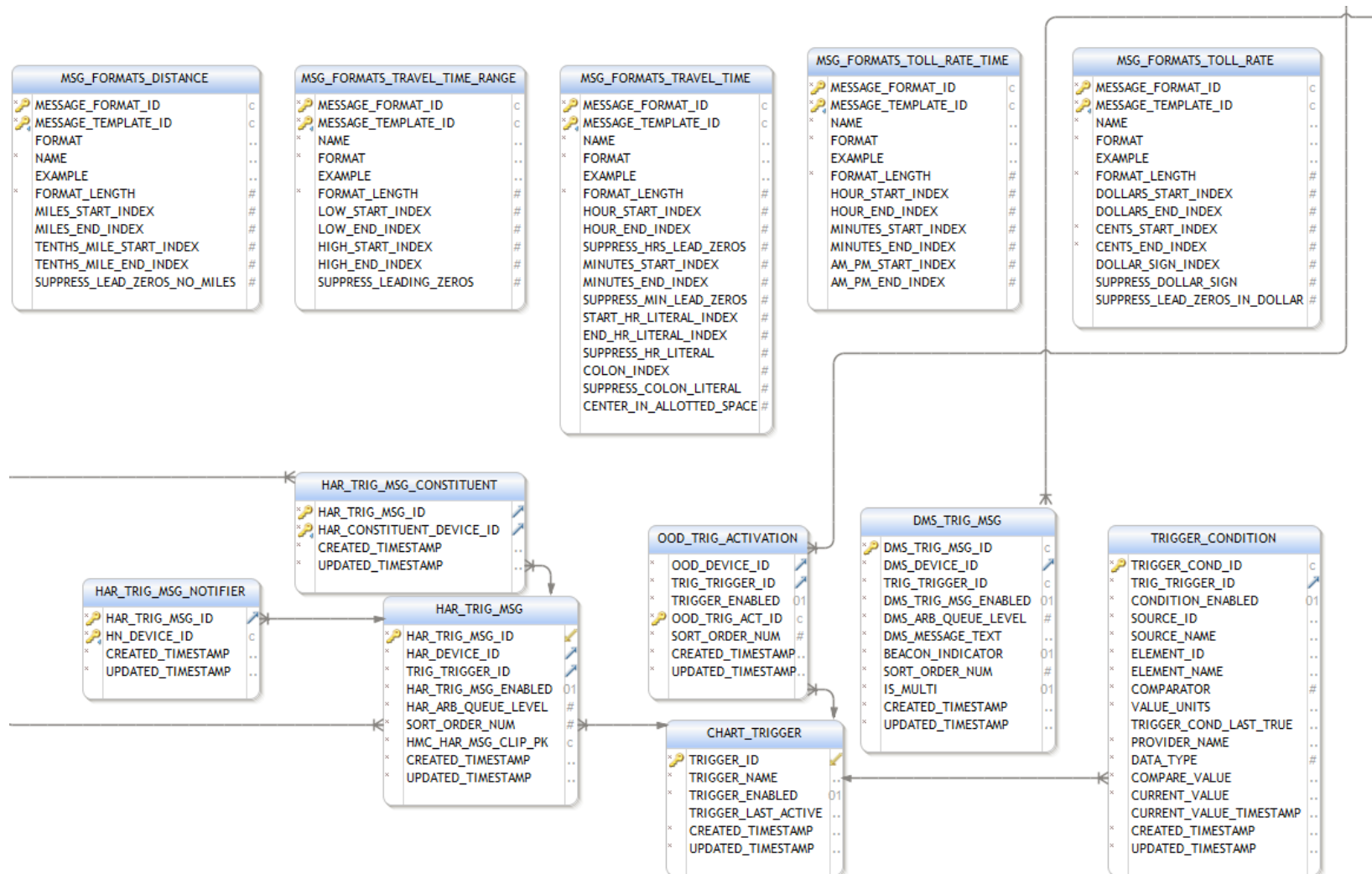


Figure 3-17. CHART\_Live ERD, Page 4-3

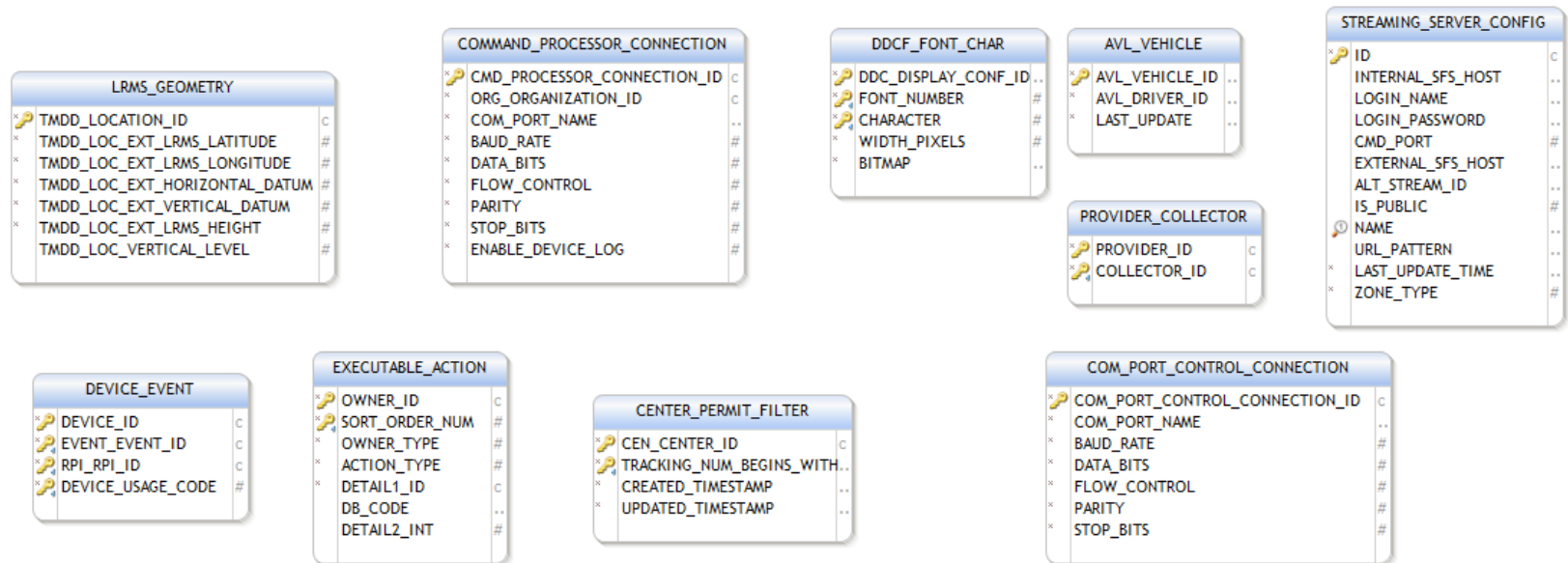


Figure 3-18. CHART\_Live ERD, Page 4-4

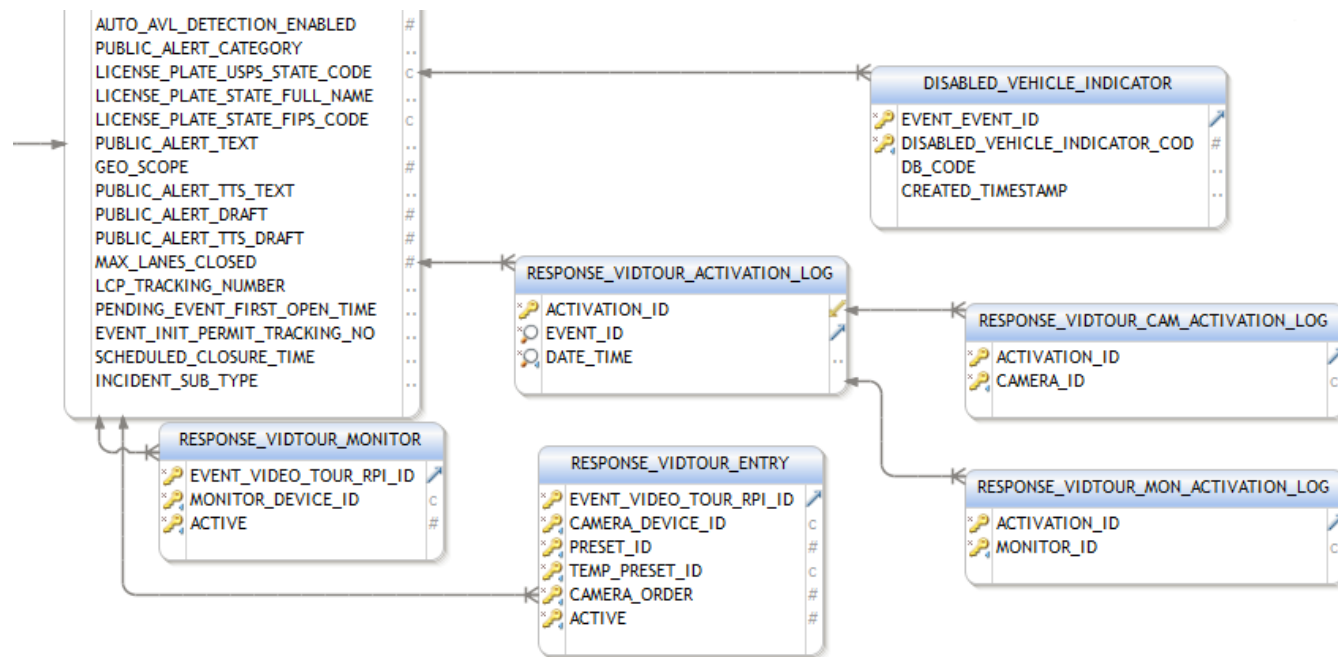


Figure 3-19. CHART\_Live ERD, Page 5-2

#### **3.1.1.2.1.2 CHART Archive Database Entity Relationship Diagram (ERD)**

The CHART ATMS CHART\_Archive Database entity relationship diagram for R16 is shown below in the ten figures that follow, in Figure 2-26 through Figure 2-35. Figure 2-26 is a visual table of contents into the remaining figures. The remaining figures should be mentally arranged into a grid three images wide (numbered 1-3) and three images tall (numbered 0-2), if desired to follow tables that had to be split across pages and connector lines which transverse between pages. Figure 2-27 is in the upper left, with Figure 2-28 and Figure 2-29 to the right, with Figure 2-30 starting the second row. The Table Definition Report sections that follow describe the changes that are made for R16.





Generated using BitChute

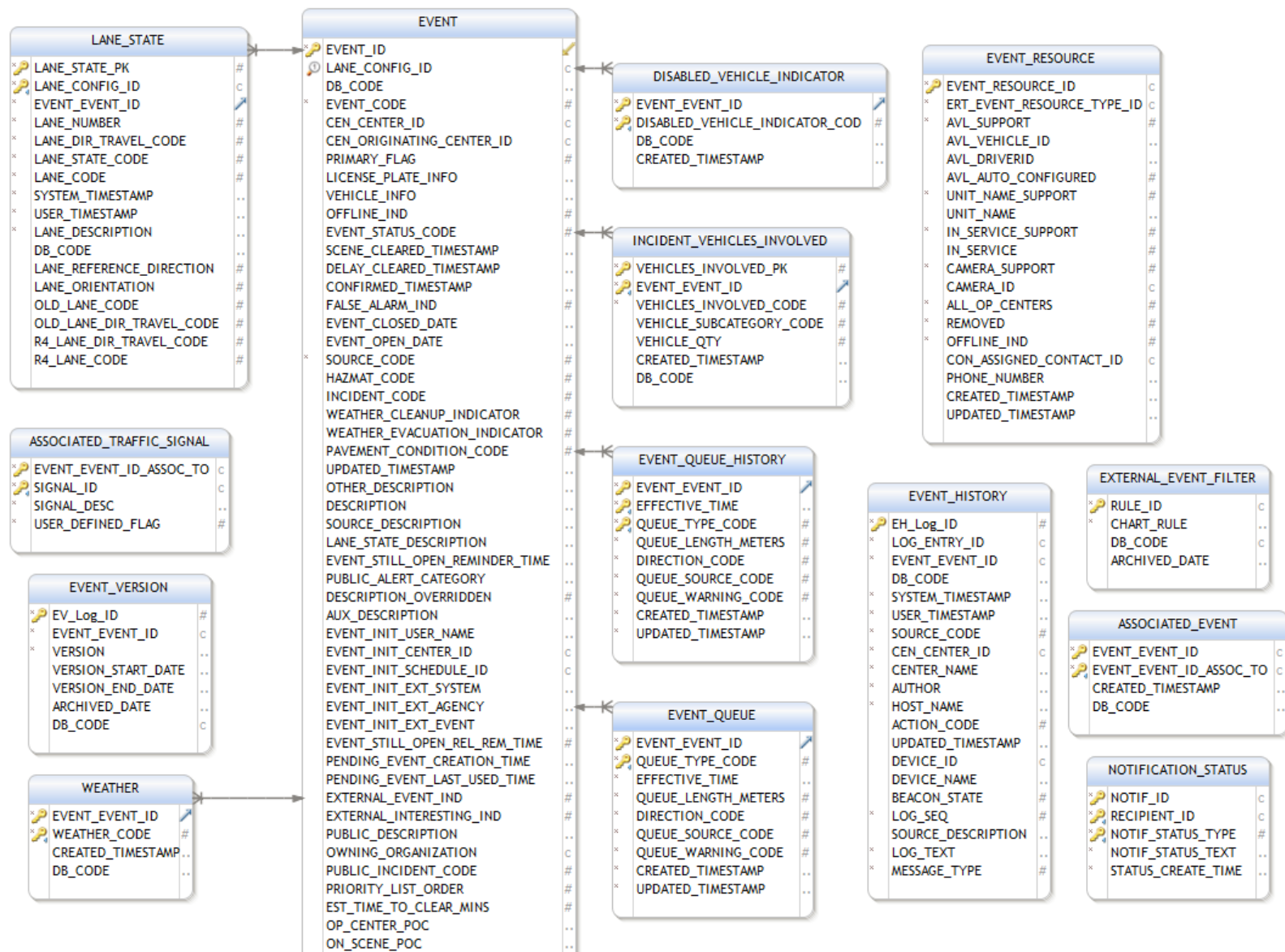


Figure 3-21. CHART\_Archive ERD, Page 1-1

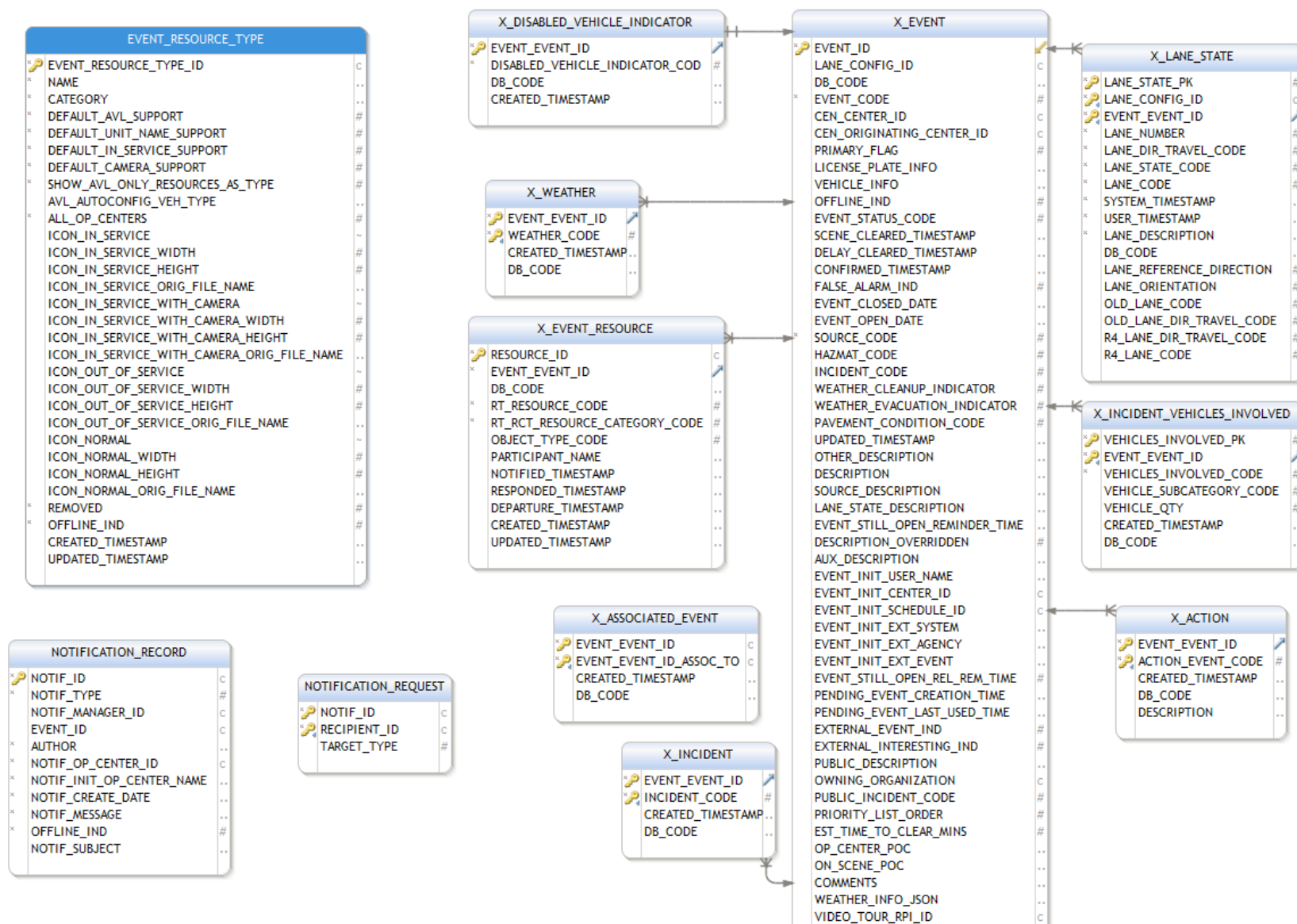


Figure 3-22. CHART\_Archive ERD, Page 1-2

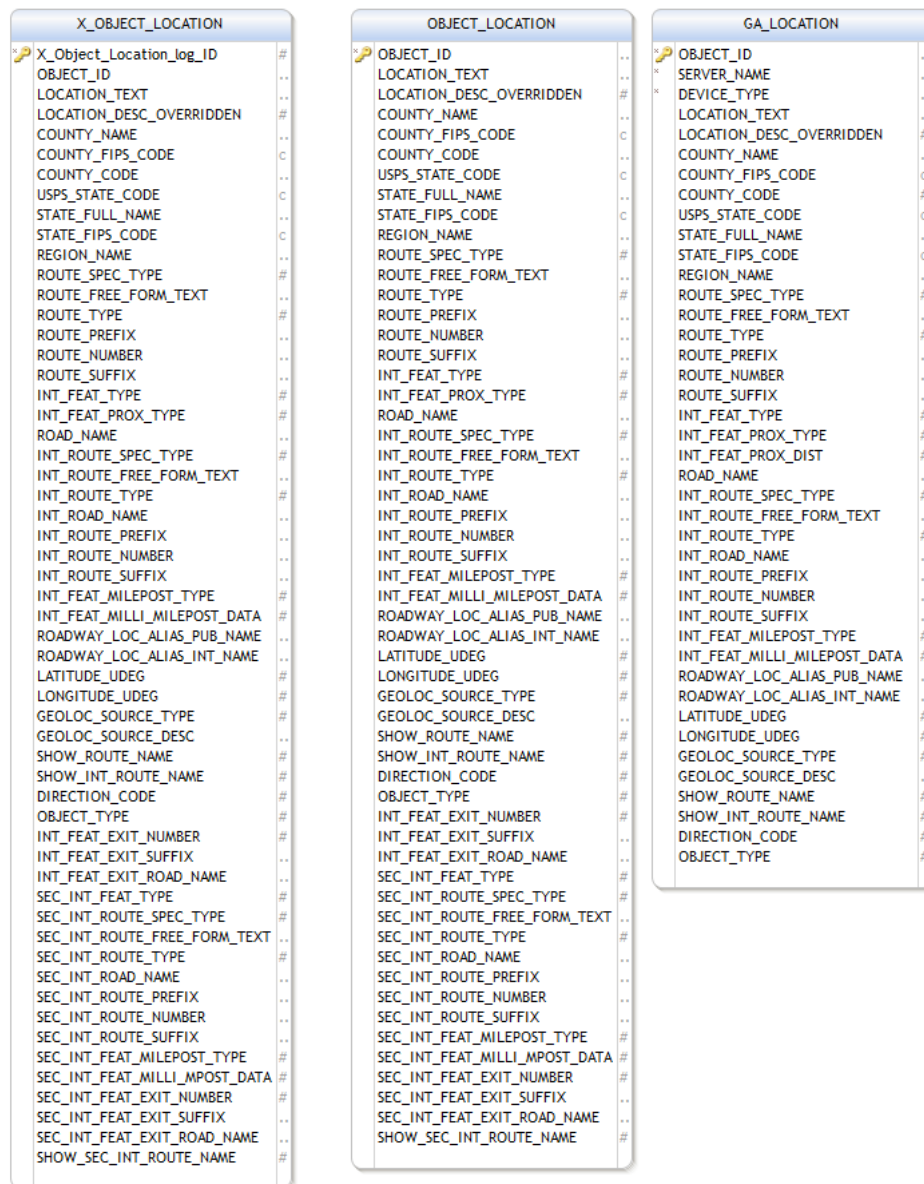


Figure 3-23. CHART\_Archive ERD, Page 1-3



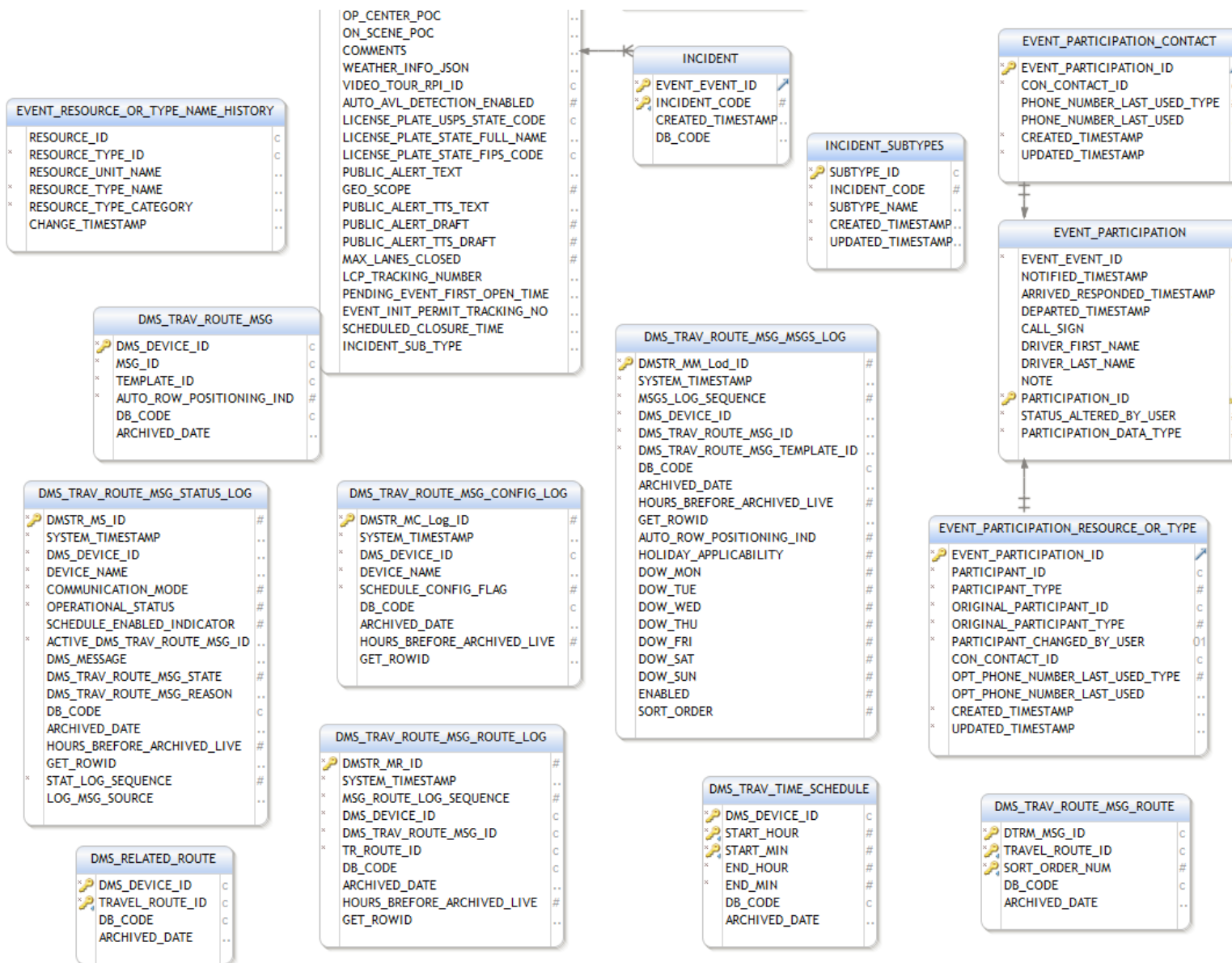


Figure 3-24. CHART\_Archive ERD, Page 2-1

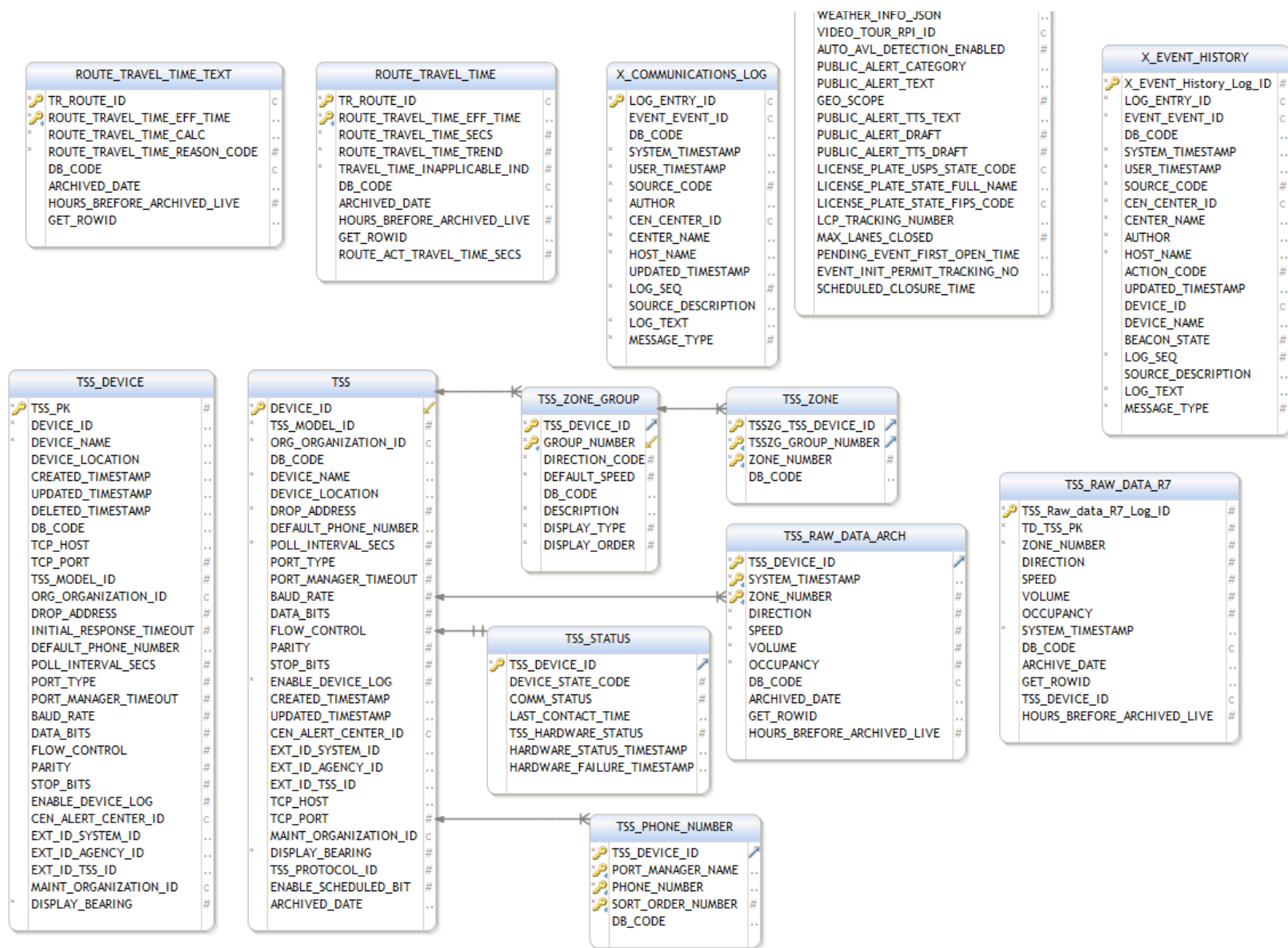


Figure 3-25. CHART\_Archive ERD, Page 2-2

RESPONSE_VIDTOUR_MON_ACTIVATION_LOG		
×	ACTIVATION_ID	C
×	MONITOR_ID	C

RESPONSE_VIDTOUR_CAM_ACTIVATION_LOG		
×	ACTIVATION_ID	C
×	CAMERA_ID	C

RESPONSE_VIDTOUR_ACTIVATION_LOG		
×	ACTIVATION_ID	C
×	EVENT_ID	C
×	DATE_TIME	..

LINK_TRAVEL_TIME		
×	RL_LINK_ID	C
×	LINK_TRAVEL_TIME_EFF_TIME	..
×	LINK_TRAVEL_TIME_SECS	#
×	LINK_TRAVEL_TIME_QUAL	#
×	LINK_TRAVEL_TIME_TREND	#
	DB_CODE	C
	ARCHIVED_DATE	..
	HOURS_BREFORE_ARCHIVED_LIVE	#
	GET_ROWID	..

LINK_SMOOTHED_DATA		
×	LINK_DATA_IMPORT_ID	#
×	EXT_LINK_ID	C
×	LINK_TRAVEL_TIME_EFF_TIME	..
×	LINK_TRAVEL_TIME_SECS	#
×	LINK_TRAVEL_TIME_QUAL	#
×	LINK_SPEED_MPH	#
	DB_CODE	C
	ARCHIVED_DATE	..
	HOURS_BREFORE_ARCHIVED_LIVE	#
	GET_ROWID	..
	LINK_HIST_AVG_SPEED_MPH	#

LINK_RAW_DATA		
×	LINK_DATA_IMPORT_ID	#
×	EXT_LINK_ID	C
×	LINK_TRAVEL_TIME_EFF_TIME	..
×	LINK_TRAVEL_TIME_SECS	#
×	LINK_TRAVEL_TIME_QUAL	#
×	LINK_SPEED_MPH	#
	DB_CODE	C
	ARCHIVED_DATE	..
	HOURS_BREFORE_ARCHIVED_LIVE	#
	GET_ROWID	..
	LINK_HIST_AVG_SPEED_MPH	#

LINK_DATA_IMPORT		
×	IMPORT_ID	#
×	SYSTEM_TIMESTAMP	..
×	EXT_SYS_NAME	..
	DB_CODE	C
	ARCHIVED_DATE	..
	HOURS_BREFORE_ARCHIVED_LIVE	#
	GET_ROWID	..

LINK_QUEUE_EXCLUSION		
×	EXT_SYS_NAME	..
×	EXT_LINK_ID	..
×	CREATED_TIMESTAMP	..
×	UPDATED_TIMESTAMP	..

LINK_CONNECTION		
×	EXT_SYS_NAME	..
×	EXT_LINK_ID	..
×	EXT_SYS_NAME_UPSTREAM	..
×	EXT_LINK_ID_UPSTREAM	..
×	GAP_LENGTH_MILLI_MILES	#
×	CREATED_TIMESTAMP	..
×	UPDATED_TIMESTAMP	..

Figure 3-26 CHART\_Archive ERD, Page 2-3

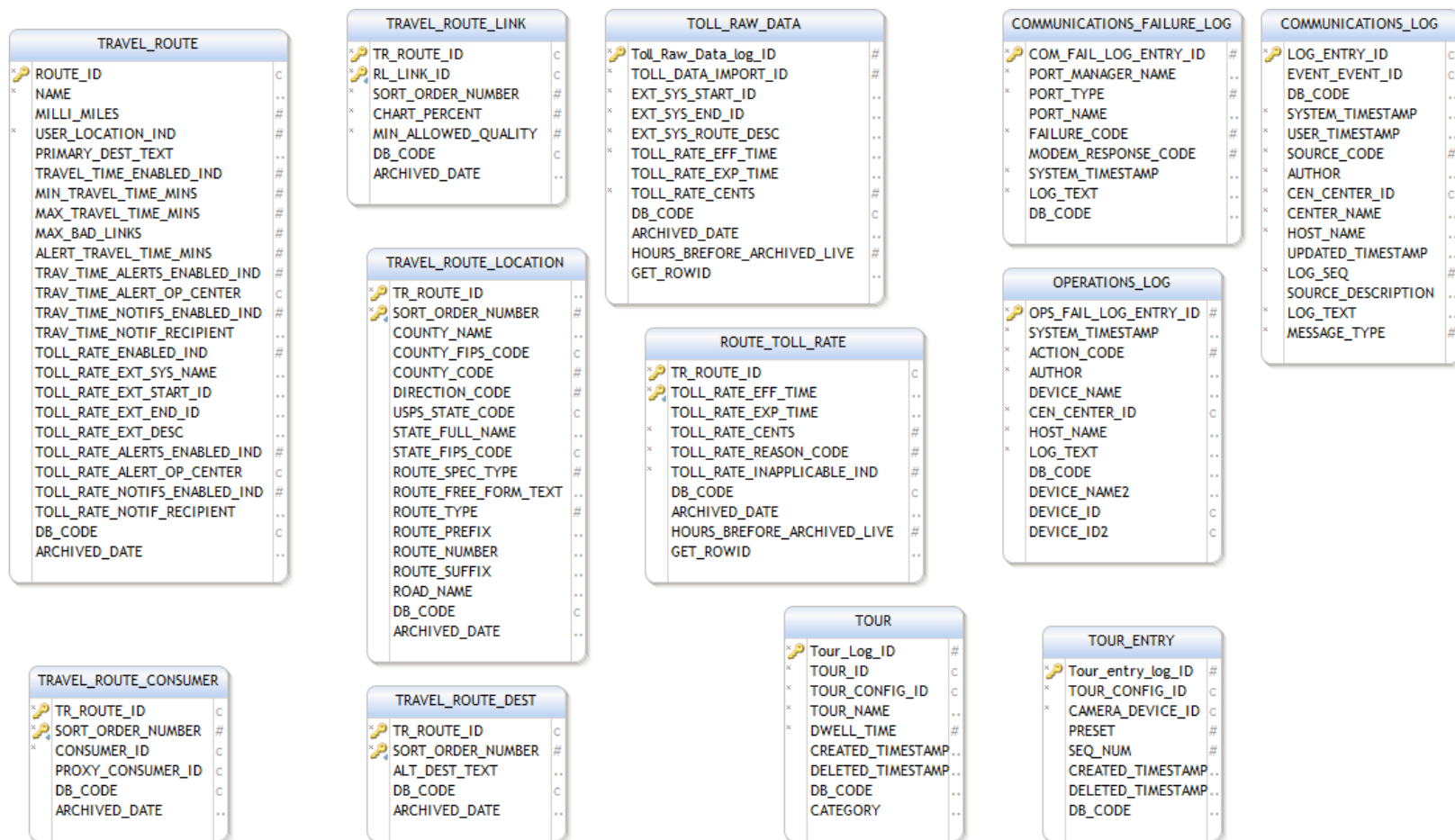


Figure 3-27 CHART\_Archive ERD, Page 3-1



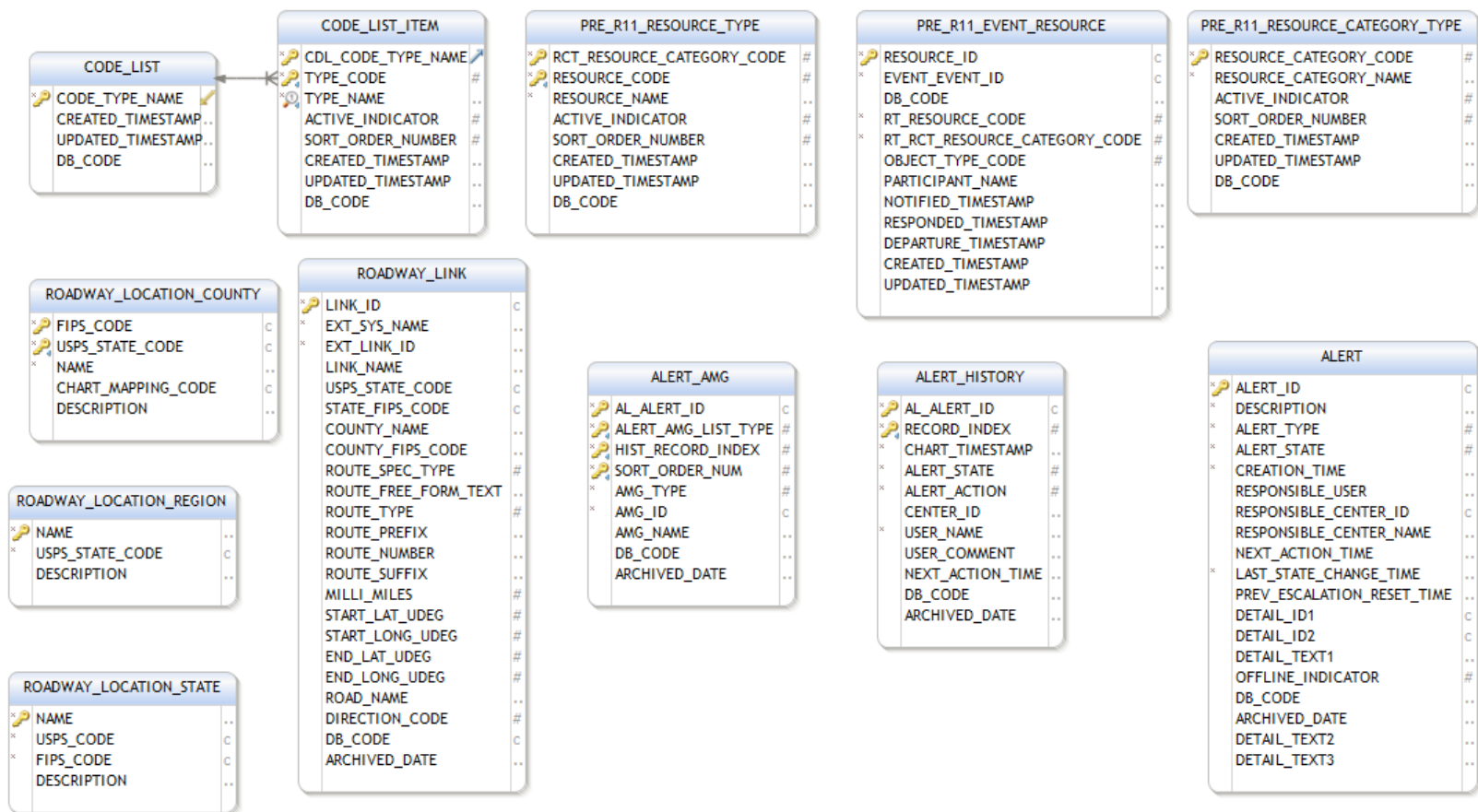


Figure 3-28 CHART\_Archive ERD, Page 3-2

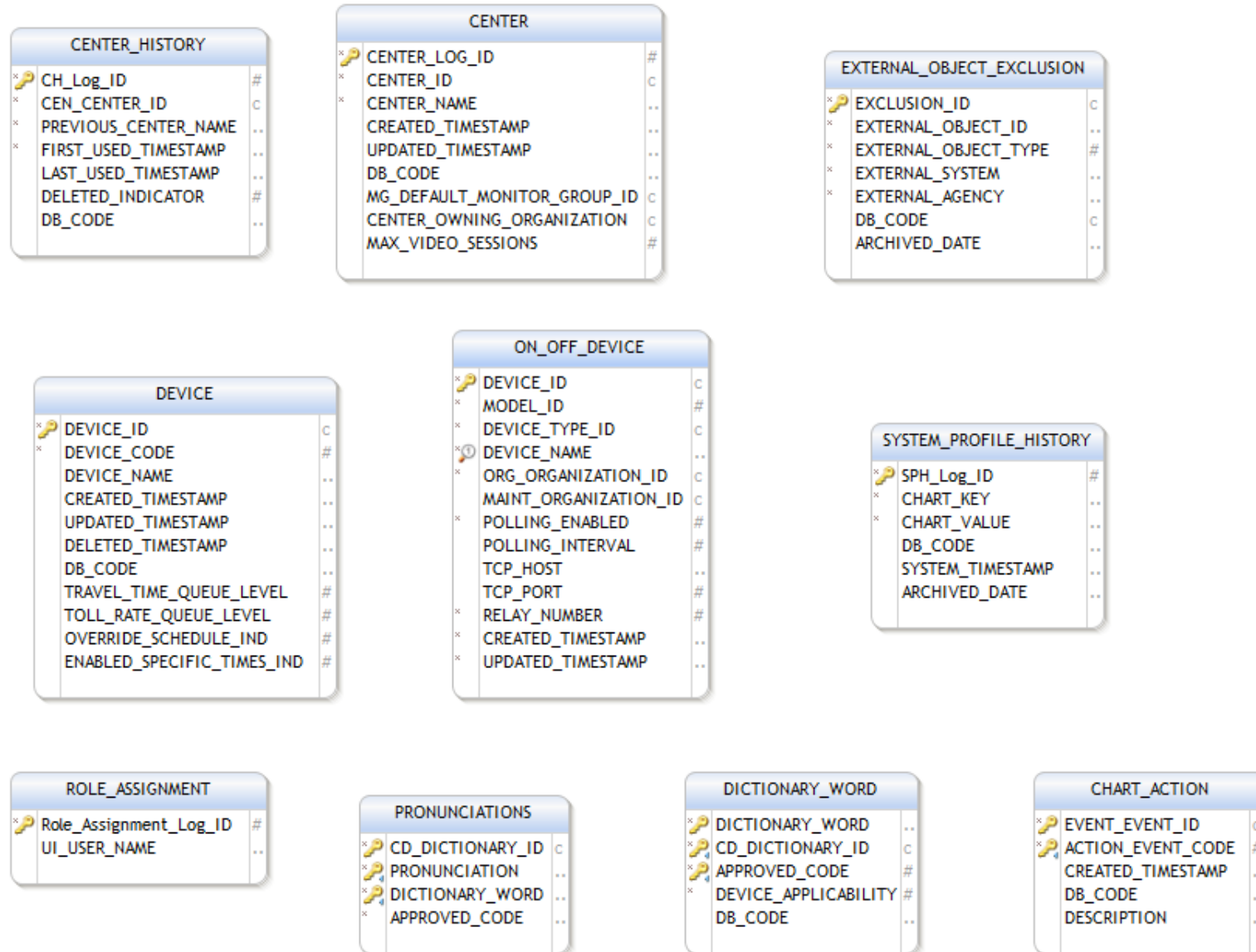


Figure 3-29. CHART\_Archive ERD, Page 3-3

#### **3.1.1.2.1.3 Function to Entity Matrix Report**

The Create, Retrieve, Update, Delete (CRUD) matrix cross-references business functions to entities and shows the use of the entities by those functions. This report is generated as part of the CHART O&M Guide.

#### **3.1.1.2.1.4 Table Definition Report –**

In tables shown below:

- Deleted columns/constraints marked with a minus sign (“-”)
- Modified columns/constraints marked with an asterisk (“\*”)
- New columns/constraints marked with a plus sign (“+”)

##### *3.1.1.2.1.4.1 Database Changes for ATMS-1966 Remove obsolete directories / files from the ATMS codebase*

###### 3.1.1.2.1.4.1.1 CHART ATMS DB

The changes for PR ATMS-1966 drop the following tables from the database:

BRIDGE\_CIRCUIT  
BRIDGE\_CIRCUIT\_STATUS  
COMMAND\_PROCESSOR\_CONNECTION  
V1500CDU  
V1500HOST  
V1500KEYPAD  
VIDEO\_SWITCH  
VIDEO\_SWITCH\_CONNECTION  
VIDEO\_SWITCH\_STATUS

The following associated views are also dropped:

VIEW\_V1500HOST  
VIEW\_V1500KEYPAD  
VW\_COMM\_PROCESSOR\_CONNECTION  
VW\_VIDEO\_SWITCH  
VW\_VIDEO\_SWITCH\_CONNECTION  
VW\_VIDEO\_SWITCH\_STATUS

The MONITOR\_GROUP table is modified to drop two columns related to video routing:

### MONITOR\_GROUP Table (Modified)

-PRIORITY

-GUARANTEED\_NUM\_ROUTES

The functional right descriptions are changed for the video network rights:

FR_ID	FR_NAME	FR_DESCRIPTION
73	ViewVideoNetworkConfig	Allows the holder to view the configurations of video fabrics.  Changed from: Allows the holder to view the configurations of video fabrics, switches and bridge circuits, and to view video routes.)
74	ConfigureVideoNetwork	Allows the holder to add, delete, and configure video fabrics. (This right should be granted to very few highly knowledgeable administrators.)  Changed from: Allows the holder to add, delete, and configure video fabrics, switches, bridge circuits and command processors. (This right should be granted to very few highly knowledgeable administrators.)

*3.1.1.2.1.4.2 Database Changes for ATMS-1967 Keep track of stats / report of which GUI actions have been invoked*

3.1.1.2.1.4.2.1 CHART ATMS DB

The changes for PR ATMS-1967 add the GUI\_ACTION\_USAGE table:

### GUI\_ACTION\_USAGE Table (New)

+ ACTION\_NAME VARCHAR(128) NOT NULL  
+ REQ\_HDLR\_SIMPLE\_NAME VARCHAR(128) NOT NULL  
+ REQ\_HDLR\_CLASS\_NAME VARCHAR(256) NOT NULL  
+ REGISTRATION\_TIME DATETIME2(0) NOT NULL DEFAULT GETDATE()  
+ LAST\_USAGE\_TIME DATETIME2(0) NULL  
+ INVOCATION\_COUNT BIGINT NOT NULL DEFAULT 0

Primary Key (ACTION\_NAME)

Grant all rights to CHARTLITE\_SERVICE\_ROLE, DEVELOPER\_ROLE

*3.1.1.2.1.4.3 Database Changes for ATMS-1979 remove obsolete user rights*

3.1.1.2.1.4.3.1 CHART DB

The R17 cleanup obsolete user rights feature removes existing user rights from the FUNCTIONAL\_RIGHT table.

The following values are removed from the FUNCTIONAL\_RIGHT Table:

FR_ID	FR_NAME	FR_DESCRIPTION
-------	---------	----------------



+ TRIGGER_ID	CHAR(32)	NOT NULL
+ TRIGGER_NAME	VARCHAR(15)	NOT NULL
+ ENABLED	BIT	NOT NULL

PRIMARY KEY: SYSTEM\_TIMESTAMP, TRIGGER\_ID

#### **TRIGGER\_CONFIG\_CONDS\_LOG Table (New):**

**Rights: The SCHEDULESERVICE user requires insert rights for this table.**

This new table stores a trigger's list of conditions at a given point in time.

TRIGGER\_CONFIG\_CONDS\_LOG Columns:

+ SYSTEM_TIMESTAMP	DATETIME2	NOT NULL
+ TRIG_CONFIG_LOG_SEQUENCE	NUMERIC(10, 0)	NOT NULL
+ TRIGGER_ID	CHAR(32)	NOT NULL
+ TRIGGER_COND_ID	CHAR(32)	NOT NULL
+ CONDITION_ENABLED	BIT	NOT NULL
+ PROVIDER_NAME	VARCHAR(60)	NOT NULL
+ SOURCE_ID	VARCHAR(32)	NOT NULL
+ SOURCE_NAME	VARCHAR(60)	NOT NULL
+ ELEMENT_ID	VARCHAR(32)	NOT NULL
+ ELEMENT_NAME	VARCHAR(60)	NOT NULL
+ DATA_TYPE	TINYINT	NOT NULL
+ COMPARATOR	INT	NOT NULL
+ COMPARE_VALUE	VARCHAR(40)	NOT NULL
+ VALUE_UNITS	VARCHAR(10)	NOT NULL

PRIMARY KEY: SYSTEM\_TIMESTAMP, TRIG\_CONFIG\_LOG\_SEQUENCE, TRIGGER\_ID

#### **TRIGGER\_STATUS\_LOG Table (New):**

**Rights: The SCHEDULESERVICE user requires insert rights for this table.**

This new table stores trigger status data (trigger level, not trigger condition level) at a given point in time.

TRIGGER\_STATUS\_LOG Columns:

+ SYSTEM_TIMESTAMP	DATETIME2	NOT NULL
+ STAT_LOG_SEQUENCE	NUMERIC(9, 0)	NOT NULL
+ TRIGGER_ID	CHAR(32)	NOT NULL
+ TRIGGER_NAME	VARCHAR(15)	NOT NULL
+ TRIGGER_ENABLED	BIT	NOT NULL
+ TRIGGER_ACTIVE	BIT	NOT NULL

+ TRIGGER_LAST_ACTIVE	DATETIME2	NULL
-----------------------	-----------	------

PRIMARY KEY: STAT\_LOG\_SEQUENCE, TRIGGER\_ID, SYSTEM\_TIMESTAMP

#### **TRIGGER\_CONDS\_STATUS\_LOG Table (New):**

**Rights: The SCHEDULESERVICE user requires insert rights for this table.**

This new table stores status for a trigger's conditions at a given point in time.

TRIGGER\_CONDS\_STATUS\_LOG Columns:

+ SYSTEM_TIMESTAMP	DATETIME2	NOT NULL
+ COND_LOG_SEQUENCE	NUMERIC(9, 0)	NOT NULL
+ TRIGGER_ID	CHAR(32)	NOT NULL
+ TRIGGER_COND_ID	CHAR(32)	NOT NULL
+ TRIGGER_COND_LAST_TRUE	DATETIME2	NULL
+ CURRENT_VALUE	VARCHAR(40)	NOT NULL
+ CURRENT_VALUE_TIMESTAMP	DATETIME2	NULL
+ ACTIVE	BIT	NOT NULL
+ ENABLED	BIT	NOT NULL
+ COND_TRUE	BIT	NOT NULL
+ STALE	BIT	NOT NULL

PRIMARY KEY: TRIGGER\_ID, SYSTEM\_TIMESTAMP, COND\_LOG\_SEQUENCE

#### **DMS\_TRIG\_MSG\_CONFIG\_LOG Table (New):**

**Rights: The DMSSERVICE user requires insert rights for this table.**

This new table stores a DMS device's Triggered Message configuration (top level) at a given point in time.

DMS\_TRIG\_MSG\_CONFIG\_LOG Columns:

+ SYSTEM_TIMESTAMP	DATETIME2	NOT NULL
+ DMS_DEVICE_ID	CHAR(32)	NOT NULL
+ DEVICE_NAME	VARCHAR(15)	NOT NULL

PRIMARY KEY: SYSTEM\_TIMESTAMP, DMS\_DEVICE\_ID

#### **DMS\_TRIG\_MSG\_MSGS\_LOG Table (New):**

**Rights: The DMSSERVICE user requires insert rights for this table.**

This new table stores a DMS device's Triggered Message configuration (individual triggered messages) at a given point in time.

**DMS\_TRIG\_MSG\_MSGS\_LOG Columns:**

+ SYSTEM_TIMESTAMP	DATETIME2	NOT NULL
+ MSGS_LOG_SEQUENCE	NUMERIC(10, 0)	NOT NULL
+ DMS_DEVICE_ID	CHAR(32)	NOT NULL
+ DMS_TRIGGERED_MSG_ID	CHAR(32)	NOT NULL
+ TRIGGER_ID	CHAR(32)	NOT NULL
+ ENABLED_FLAG	BIT	NOT NULL
+ DMS_ARB_QUEUE_LEVEL	TINYINT	NOT NULL
+ DMS_MESSAGE_TEXT	VARCHAR(1024)	NOT NULL

PRIMARY KEY: SYSTEM\_TIMESTAMP, MSGS\_LOG\_SEQUENCE , DMS\_DEVICE\_ID

**DMS\_TRIG\_MSG\_STATUS\_LOG Table (New):**

**Rights: The DMSSERVICE user requires insert rights for this table.**

This new table stores a DMS device's Triggered Message status (top level) at a given point in time.

**DMS\_TRIG\_MSG\_STATUS\_LOG Columns:**

+ SYSTEM_TIMESTAMP	DATETIME2	NOT NULL
+ STAT_LOG_SEQUENCE	NUMERIC(9, 0)	NOT NULL
+ DMS_DEVICE_ID	CHAR(32)	NOT NULL
+ DEVICE_NAME	VARCHAR(15)	NOT NULL
+ COMMUNICATION_MODE	NUMERIC(1, 0)	NOT NULL
+ OPERATIONAL_STATUS	NUMERIC(1, 0)	NOT NULL
+ DMS_MESSAGE	VARCHAR(1024)	NULL
+ DMS_TRIG_ACTION_STATE	NUMERIC(2, 0)	NULL
+ DMS_TRIG_MSG_REASON	VARCHAR(4000)	NULL
+ LOG_MSG_SOURCE	VARCHAR(128)	NULL

PRIMARY KEY: DMS\_DEVICE\_ID, MSGS\_LOG\_SEQUENCE, SYSTEM\_TIMESTAMP

**DMS\_TRIG\_MSG\_STATUS\_MSGS\_LOG Table (New):**

**Rights: The DMSSERVICE user requires insert rights for this table.**

This new table stores a DMS device's Triggered Message status (active messages) at a given point in time.

**DMS\_TRIG\_MSG\_STATUS\_MSGS\_LOG Columns:**



+ SYSTEM_TIMESTAMP	DATETIME2	NOT NULL
+ STAT_LOG_SEQUENCE	NUMERIC(10, 0)	NOT NULL
+ DMS_DEVICE_ID	CHAR(32)	NOT NULL
+ ACTIVE_TRIG_MSG_ID	CHAR(32)	NOT NULL
+ TRIGGER_ID	CHAR(32)	NOT NULL

PRIMARY KEY: DMS\_DEVICE\_ID, STAT\_LOG\_SEQUENCE, SYSTEM\_TIMESTAMP

#### **3.1.1.2.1.5 Database Conversion**

There are no data conversion / migration tasks identified for CHART ATMS R17.

#### **3.1.1.2.1.6 PL/SQL Module Definition and Database Trigger Reports**

There are no new PL/SQL modules for CHART ATMS R17.

#### **3.1.1.2.1.7 Database Size Estimate - provides size estimate of current design**

CHART ATMS R17 affects the size of the CHART ATMS database as follows:

- ATMS-1239 The comm loss timeout backup records will be stored in the System Profile table, but there should not be more than a handful of these records and the data size is very small.
- ATMS-1966 Several tables and views related to the video network are dropped, but all of these tables are expected to contain few if any rows.
- ATMS-1967 The new GUI\_ACTION\_USAGE table will contain approximately 1000 rows, as that is approximately how many GUI actions exist, but the number of rows will remain static for the duration of each software release.
- **ATMS-2022 TODO (IMPORTANT)**

#### **3.1.1.2.1.8 Data Distribution**

There are no changes to data distribution for R17.

#### **3.1.1.2.1.9 Database Replication**

Database replication is not used in R17.

#### **3.1.1.2.1.10 Database Failover Strategy**

**The database failover strategy is defined as part of Work Order 27.** There are no changes to the database failover strategy for R17.

#### **3.1.1.2.1.11 Reports**

No reports are added or updated for R17. Since R5, the CHART reporting function has been transferred to University of Maryland.

## **3.2 Non-Database Management System Files**

The following describes any updates to application data files (used for input or output), that are non-DBMS.

### **3.2.1 ATMS**

The following describes the use of flat files in CHART ATMS.

#### **3.2.1.1 *Service Registration Files***

There are no changes to service registration files for CHART ATMS R17.

#### **3.2.1.2 *Service Property Files***

Service property files are organized the same for CHART ATMS R17 as previously. (There are no new property files, though various changes are necessary in some of the files.)

#### **3.2.1.3 *GUI Property Files***

The GUI properties file is located in the WEB-INF directory for CHART ATMS R17. There are various changes to the properties defined therein.

#### **3.2.1.4 *Device Logs***

There are no changes to Device Log Files for CHART ATMS R17.

#### **3.2.1.5 *Service Process Logs***

All CHART ATMS services write to a process log, used to provide a historical record of activity undertaken by the services. These logs are occasionally referenced by software engineering personnel to diagnose a problem or reconstruct a sequence of events leading to a particular anomalous situation. These logs are automatically deleted by the system after a set period of time defined by the service's properties file, so they do not accumulate infinitely. These files are stored in the individual service directories and are named by the service name and date, plus a ".txt" extension. These logs are typically read only by software engineering personnel. There are no changes to the organization of service process log files for CHART ATMS R17.

#### **3.2.1.6 *Service Error Logs***

All CHART ATMS services write to an error log, used to provide detail on certain errors encountered by the services. Most messages, including most errors, are captured by the CHART ATMS software and written to the process logs, but certain messages (typically produced by the Java Virtual Machine itself, by COTS, or DLLs) cannot be captured by CHART ATMS Software and instead are captured in these "catch-all" logs. Errors stored in these logs are typically problems resulting from a bad installation; once the system is up and running, errors rarely appear in these error logs. Debugging information from the JacORB COTS, which is not usually indicative of errors, can routinely be found in these error logs, as well. These log files can be reviewed by software engineering personnel to diagnose an installation problem or other type of problem. These logs are automatically deleted by the system after a set period of time defined by

the service's properties file, so they do not accumulate infinitely. These files are stored in the individual service directories and are named by the service name and date, plus an ".err" extension. These logs are typically read only by software engineering personnel. There are no changes for service error logs for R17 features.

### **3.2.1.7 GUI Process Logs**

Like the CHART background services, the CHART ATMS GUI service also writes to a process log file, used to provide a historical record of activity undertaken by the process. These GUI process logs are occasionally referenced by software engineering personnel to diagnose a problem or reconstruct a sequence of events leading to a particular anomalous situation. These logs are automatically deleted by the system after a set period of time defined by the GUI service's properties file, so they do not accumulate infinitely. These files are stored in the chartlite/LogFiles/ directory under the WebApps/ directory in the Apache Tomcat installation area. They are named by the service name ("chartlite") and date, plus a ".txt" extension. These logs are typically read only by software engineering personnel. Additional log files written by the Apache Tomcat system itself are stored in the log/ directory in the Apache Tomcat installation area.

- The CHART ATMS R17 GUI changes do not change the way the GUI process logs operate.

### **3.2.1.8 FMS Port Configuration Files**

The CHART ATMS Communications Services read a Port Configuration file, typically named PortConfig.xml, upon startup, which indicates which ports are to be used by the service and how they are to be initialized. A Port Configuration Utility is provided which allows for addition, removal of ports and editing of initialization parameters. As indicated by the extension, these files are in XML format. This means these files are hand-editable, although the Port Configuration Utility allows for safer, more controlled editing. The Port Configuration files are typically modified only by software engineers or telecommunications engineers.

- There are no changes to this section for the any of the CHART ATMS R17 features.

### **3.2.1.9 Watchdog Configuration Files**

The Watchdog service uses XML configuration files to specify what actions to take for each ATMS service. There are no changes to the Watchdog configuration files for CHART ATMS R17.

## **3.2.2 Mapping**

The following describes the use of flat files in CHART Mapping.

### **3.2.2.1 Web Config Files**

There are no changes to web config files

## 4 HUMAN-MACHINE INTERFACE

### 4.1 ATMS-882: Add Banned Pronunciation word to Dictionary displays wrong text.

This section describes the change for correcting the error message that is displayed on the Manage TTS Pronunciation Page in the CHART GUI while adding a Banned word which already exists.

**Manage TTS Pronunciation List (40)**

[Show All](#) [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

Word	<input type="text" value="ahed"/>
Pronunciation	<input type="text" value="ahead"/>

[Preview](#)

Figure 4-1 Adding a TTS Pronunciation

When adding an existing banned word to the Manage TTS Pronunciation Page, the former velocity error message i.e. "\$util.escapeHTML(text)" will now display a descriptive error message instead.

[Toggle Menu](#) | [Recent Events](#) | [Back](#) | [Forward](#) | [Refresh](#) | [Center Rpt](#) | [Comm. Log](#) | [Instant Messaging](#) | [Home Page](#) | [Intranet Map](#) | [Traffic Events](#) | [Help](#)

**Error**

An error has occurred. See the details below.

Error adding pronunciation: Ahed already exists in the list of Banned words.

Figure 4-2 Corrected Error When Adding Banned Word To Pronunciations

### 4.2 ATMS-888: Inconsistent date format in CHART log files.

This section describes the change to the CHART ATMS log files to improve readability for production issues and issue resolution. This change will apply to all ATMS log files and appears in the below format (Refer to Figure 4-27).

```
2016/08/30 13:36:13.483 Th: localhost-startStop-1 Cl: CHART2.webservices.base.WebServiceProperties - Loaded DB Driver class for chart
database: com.microsoft.sqlserver.jdbc.SQLServerDriver
2016/08/30 13:36:13.523 Th: localhost-startStop-1 Cl: CHART2.webservices.base.WebServiceProperties - Test connection to chart database
successful.
2016/08/30 13:36:13.574 Th: localhost-startStop-1 Cl: CHART2.webservices.base.WebService - Initializing the CORBA ORB...
2016/08/30 13:36:13.582 Th: localhost-startStop-1 Cl: CHART2.utility.Corba.JacORB.ServiceTraceInitializer - ServiceTraceInterceptor
successfully enabled with log interval of 60 minute(s).
2016/08/30 13:36:13.591 Th: localhost-startStop-1 Cl: CHART2.utility.Corbautilities - Dynamically instantiated ORBSpecific object of type:
CHART2.utility.Corba.JacORB.JacORBSpecific
2016/08/30 13:36:13.592 Th: localhost-startStop-1 Cl: CHART2.webservices.base.WebService - Resolving the root POA...
2016/08/30 13:36:13.594 Th: localhost-startStop-1 Cl: CHART2.webservices.base.WebService - Setting up the persistent POA...
2016/08/30 13:36:13.594 Th: localhost-startStop-1 Cl: CHART2.webservices.base.WebService - Activating the POA Manager...
2016/08/30 13:36:13.594 Th: localhost-startStop-1 Cl: CHART2.webservices.base.WebService - ORB and POA initialization complete.
2016/08/30 13:36:13.595 Th: localhost-startStop-1 Cl: CHART2.utility.Corba.JacORB.JacORBSpecific - in orbGetServerPort
2016/08/30 13:36:13.597 Th: localhost-startStop-1 Cl: CHART2.utility.Corba.JacORB.JacORBSpecific - in op port - 9154
2016/08/30 13:36:13.605 Th: localhost-startStop-1 Cl: CHART2.utility.Corba.JacORB.PreferPortRangeSocketFactory - ORB connect timeout: 5000
2016/08/30 13:36:13.605 Th: localhost-startStop-1 Cl: CHART2.utility.Corba.JacORB.PreferPortRangeSocketFactory - ORB connect timeout is
```





Figure 4-3 CHART Log files withYYYY/MM/DD Format

### 4.3 ATMS-1239: Create a Capability to set Comm Loss Timeouts for Multiple DMSs

This section describes the changes to the CHART ATMS GUI for the Set Comm Loss for Multiple DMSs functionality.

#### 4.3.1 DMS List

On the DMS List page, a new link is added: Set Comm Loss Timeout for Multiple DMSs. This link only appears if the user has the proper rights, including Configure DMS, Maintain DMS, and Manage Device Comms. A second link, Restore Comm Loss Timeouts, is added (for users with the same rights) if any comm loss timeout backups are available.

Creek )								
 <a href="#">8872</a> US 50 East Prior to EX 28 Bay Dale Dr.	NTCIP		OFF	Online	US 50	East	Anne Arundel County	* This DMS (Travel Route Message)
 <a href="#">AKDMS10</a> I-270 NORTH AT 270 SPUR	NTCIP		OFF	Online	I-270	North	Montgomery County	* This DMS (Travel Route Message)






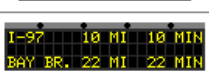
[Add DMS](#) [Poll Multiple Online DMSs](#) [Set Comm Loss Timeout for Multiple DMSs](#) [Restore Comm Loss Timeouts...](#)

**Figure 4-4 DMS List: Set Comm Loss for Multiple DMSs**

Clicking on Set Comm Loss Timeout for Multiple DMSs brings up the multi-select list shown below. By default, it is filtered by Current Msg: Not Blank.

#### Select DMSs (FILTERED - 44 of 356 shown)

Filters: Current Msg: Not Blank [View All](#)

	<a href="#">Description</a> △ / <a href="#">Location</a>	<a href="#">Current Msg</a> Not Blank ▾	<a href="#">Device Status</a> --Any-- ▾
<input type="checkbox"/>	 1103 I-95 NORTH PRIOR TO EXIT 35A MD 216 SCAGGSVILLE RD (NB)		Online
<input type="checkbox"/>	 2206 "DS T2 OPP DN"		Online
<input type="checkbox"/>	 3313 US 50 East at Church Rd. (2 Mi. prior Ex 11 MD 197)		Online

<input type="checkbox"/>	US 50 West , 1 Mi prior Bay Br ( at Cox Creek )	20 MINUTES	Online
<input type="checkbox"/>	DMS 8872 Us 50 East Prior to EX 28 Bay Dale Dr.	BAY BRIDGE 5 MILES 6 MINUTES	Online
<input type="checkbox"/>	DMS AKDMS10 I-270 NORTH AT 270 SPUR	US 13 7 MI 8 MIN US 13 7 MI 8 MIN	Online


**Figure 4-5 Select Multiple DMSs**

The user can filter and sort the list, use the Select Visible button to select all visible checkboxes, or Clear Visible Selects to clear the visible selections, or Clear All to clear all selections (including any that may have been made prior to performing the last filtering action).

The Current Msg filter includes Blank, Not Blank, Toll Rate Msg, Roadwork Msg, Event Msg, and Non-Event Msg:

### Select DMSs (FILTERED - 44 of 356 shown)

Filters: Current Msg: Not Blank [View All](#)

	Description  / Location		Device Status
<input type="checkbox"/>	DMS 1103 I-95 NORTH PRIOR TO EXIT 35A MD 216 SCAGGSVILLE RD (NB)	<div> --Any--  Blank  <b>Not Blank</b>  Toll Rate Msg  Roadwork Msg  Event Msg  Non-Event Msg </div>	<div> --Any--  ▼ </div> Online
<input type="checkbox"/>	DMS 2206 "DS T2 OPP DN"	<div> MD 484  13 MILES  14 MINUTES </div>	Online

**Figure 4-6 Select Multiple DMSs: Current Msg Filter**

The Device Status filter includes Online, Offline, Maintenance, and Not Offline:

**Select DMSs (FILTERED - 44 of 356 shown)**

Filters: Current Msg: Not Blank [View All](#)

	Description <a href="#">△</a> / <a href="#">Location</a>	Current Msg Not Blank <a href="#">▼</a>	Device Status <a href="#">--Any--</a>
<input type="checkbox"/>	<b>DMS</b> 1103 I-95 NORTH PRIOR TO EXIT 35A MD 216 SCAGGSVILLE RD (NB)	US 13 7 MILES 8 MINUTES	Offline Online Maintenance Mode Not Offline
<input type="checkbox"/>	<b>DMS</b> 2206 "DS T2 OPP DN"	MD 494 13 MILES 14 MINUTES	Online

**Figure 4-7 Select Multiple DMSs: Device Status Filter**

Upon submission of the above form, the Set Comm Loss Timeout form is displayed. It has a checkbox allowing the user to back up the current comm loss timeout settings before setting the timeout so that they can be restored at a later time. A comment can be entered to help the user remember the purpose of the backup (or to distinguish it from other backups).

### Set Comm Loss Timeout for 36 Selected DMSs

Use Comm Loss Timeout ☒

Timeout (HH:MM)  :

Backup Current Settings ☒

Backup Comment

**Figure 4-8 Set Comm Loss Timeout for Multiple DMSs**

Clicking on Restore Comm Loss Timeouts from the DMS List brings up the Restore Comm Loss Timeouts page:

#### Restore Comm Loss Timeouts

Date/Time	User	Op Center	Comment	Num DMSs	DMSs	Action
08/30/16 10:26	djl	SOC	MD 200 Toll rate signs	13	8307 8308 8309 8312 8313 8316 8317 8320 8321 8326 8327 8328 8332	<a href="#">Restore</a> <a href="#">Remove Backup</a>
08/30/16 10:30	djl	SOC	Roadwork signs	5	3317 3325 4401 4404 4405	<a href="#">Restore</a> <a href="#">Remove Backup</a>

[Back](#)

**Figure 4-9 Restore Comm Loss Timeouts**

This page shows any comm loss timeout backups that were previously made. It shows the date/time, user, op center, comment, number of DMSs, and the DMS names. The user can click Restore to restore the comm loss settings that were previously backed up. The user can remove the backup if it is no longer needed using the Remove Backup link.

#### **4.4 ATMS-1526: NTCIP Camera details page spelling from maximimun to Maximum.**

This section describes changes for correcting the spelling on the NTCIP Camera Details Page. The change will display correct spelling in the Controllable Camera Settings section. Refer to Figure 4-26.



Categories:  
Date Commissioned: N/A

#### Control Communication Settings:

Control Device Type: IP  
NTCIP Community administrator  
NTCIP HDLC Framing: ON  
Codec Hostname / IP Address: 20.2.111.102  
Model Type: Core Tec MPEG-4  
Codec Port: 5002  
Camera Baud: 9600  
Camera Data Bits: 8  
Camera Parity: None  
Camera Stop Bits: 1  
Camera Flow Control: None

#### Controllable Camera Settings:

Polling Interval 360 seconds  
In Control Session:  
Polling Interval 300 seconds  
Outside of Control Session:  
Device Logging: ON  
Default Title Line 1: DEV CAM 2  
Default Title Line 2: LINE 2  
NTCIP Minimum Pan Control Speed: 30  
NTCIP Maximum Pan Control Speed: 110  
NTCIP Minimum Tilt Control Speed: 30  
NTCIP Maximum Tilt Control Speed: 110  
NTCIP Variable Zoom Control Speed: 100  
~~NTCIP Variable Focus Control Speed: 30~~  
NTCIP Minimum Zoom Range: 1  
NTCIP Maximum Zoom Range: 65520

#### TMDD Data:

Device Name: +NTCIP DevCam2  
CCTV Image Type: MPEG  
Camera Control Type: Status and Command  
Location - Horizontal Datum Type: WGS 84  
Location - Vertical Datum Type: WGS 84  
Location - Latitude: 0 micro degrees  
Location - Longitude: 0 micro degrees

Figure 4-10 Change of NTCIP camera settings

#### 4.5 ATMS-1685: Trigger Condition Units field not blanked upon editing.

This section describes correcting erroneous data in the units field (Miles, Degrees \*F, etc) which is displayed when selecting a different trigger condition with a blank units field. In the current ATMS system, when a trigger condition with a non-blank units' field such as Miles, MPH, °F etc. is edited or replaced with a new condition with a blank units' field, the previous values in units' field are not replaced with blank units. This change will correct the updated units' field

value when there is no value associated with a particular trigger condition as shown in the Figure 4-30.

<a href="#">Scott Trigger Test 1</a>		Y	Y	13:53	0	<a href="#">Collapse</a>	<a href="#">Disable</a>	<a href="#">Edit</a>	<a href="#">Delete</a>
Source	Element	Comparison Operator	Comparison Value	Current Value	Units	Enabled	Active	Currently True	Last True
I-68 AT Savage Mt I-68 EB at Savage Mt Road Condition		Equals	dry	dry		Y	Y	Y	13:50
I-68 AT Savage Mt I-68 WB at Savage Mt Road Condition		Equals	dry	dry		Y	Y	Y	13:50

**Figure 4-11 Showing empty field values when edited or replaced with new sensor that has blank unit field values**

## 4.6 ATMS-1966: Remove obsolete directories / files from ATMS codebase

This section describes the changes to the CHART ATMS GUI for the removal of the video router, switches, bridge circuits, video routes, and command processors.

### 4.6.1 Administer Video

On the Administer Video page, the following links are removed: Video Switches, Bridge Circuits, Video Routes, Command Processors.

## Administer Video

Please select the type of video information to administer.

Operations	Video Network
<a href="#">Video Sessions</a>	<a href="#">Video Fabrics</a>
<a href="#">Video Tours</a>	<a href="#">Video Streaming Server Configurations</a>
<a href="#">Monitor Groups</a>	

**Figure 4-12 Administer Video**

### 4.6.2 Add Camera

On the Add Camera form, the Sending Device: Switch(s) link / subsection is removed.

### Add Camera

**Camera Model**

**Name**

**Owning Organization**

**Maintaining Organization**

**Sending Device(s)**

**Encoder(s)** [Add](#)

**Video Streaming Server Configuration(s)** [Add](#)

**Camera Number**

**Location** [\(Edit\)](#)

**Location Description** MD

**County**

**Region**

**State** MARYLAND

**(Roadway location not specified.)**

**Lat/Long** Not defined

**Areas of Responsibility** Location not defined

**Figure 4-13 Add Camera: Sending Device**

In the Control Device section, the Command Processor radio button is removed.

**Control Device**

☒ IP via CODEC
 ☐ Comm Port

**Model Type**
☒ Core Tec MPEG-4
 ☐ Impath MPEG-2
 ☐ Impath i5110 H.264

**Hostname / IP**

**Port**

**COMM PORT SETTINGS FOR INFORMATIONAL PURPOSES ONLY:**

**Baud**
☐ 300
 ☐ 600
 ☐ 1200
 ☐ 2400
 ☐ 4800
 ☒ 9600
 ☐ 19200

☐ 28800
 ☐ 38400
 ☐ 57600
 ☐ 115200

**Data Bits**
☐ 5
 ☐ 6
 ☐ 7
 ☒ 8

**Parity**
☒ None
 ☐ Space
 ☐ Mark
 ☐ Even
 ☐ Odd

**Stop Bits**
☒ 1
 ☐ 1.5
 ☐ 2

**Flow Control**
☒ None
 ☐ XON/XOFF
 ☐ RTS/CTS

**Figure 4-14 Add Camera: Control Device**

### 4.6.3 Add Monitor

On the Add Monitor form, the Receiving Device: Switch radio button is removed. The only option is Decoder.

**Add Monitor**

<b>Name</b>	<input type="text"/>
<b>Owning Organization</b>	-- Select --
<b>Maintaining Organization</b>	-- Select --
<b>Date Commissioned</b>	08/22/2016
<b>Receiving Device</b>	<input checked="" type="radio"/> Decoder
<b>IP Video Fabric</b>	--Select--
<b>Hostname / IP Addr</b>	<input type="text"/>
<b>Decoder Type</b>	<input checked="" type="radio"/> Core Tec MPEG-4 <input type="radio"/> Impath VSG 1000 MPEG-2 <input type="radio"/> Impath i5110 H.264
<b>TCP Port</b>	<input type="text"/>
<b>Is Public Monitor</b>	<input checked="" type="radio"/> NO <input type="radio"/> YES
<b>Auto Mode Enabled</b>	<input checked="" type="radio"/> NO <input type="radio"/> YES
<b>Auto Mode Dwell Time:</b>	<b>Hours Minutes Seconds</b> 0   0   10
<b>Monitor Groups</b>	+--- REMShop +AOC lab +BHT lab +DEVSOC lab +FMT lab

**Site:** -- Select --

Figure 4-15. Add Monitor

### 4.6.4 Monitor: Change Display (Select Video Source)

On the Change Display (Select Video Source) form for a monitor, the Route column is removed. The list is changed to show only video sources with a video fabric matching the monitor's video fabric, as only connections within the same video fabric are now supported.

**Select Video Source**








Select	Description  / Location	Region 	Owning Org 
<input type="radio"/>	 <a href="#">SIM 16th St (MD 390) &amp; Spring St</a> 16th St (MD 390) & Spring St	I-495	MCTMC
<input type="radio"/>	 <a href="#">SIM Adelphi Rd &amp; New Hampshire Ave (MD 650)</a> Adelphi Rd & New Hampshire Ave (MD 650)	I-495	MCTMC
<input type="radio"/>	 <a href="#">SIM Airpark Rd &amp; Woodfield Rd (MD 124)</a> Airpark Rd & Woodfield Rd (MD 124)	I-270	MCTMC
	 <a href="#">SIM Arcola Ave &amp;</a>		

Figure 4-16. Change Display (Select Video Source)

#### 4.6.5 Video Source: Display on Monitors (Select Monitors)

On the Display on Monitors (Select Monitors) form for a video source, the Route column is removed. The list is changing to only show monitors with a video fabric matching the video fabrics supported by the video source, as only connections within the same video fabric are now supported.

**Select Monitors**











	Name 	Group 	Current Display
<input type="checkbox"/>	 SIM AA Co Police HQ 1	<a href="#">AA Co Police HQ</a>	
<input type="checkbox"/>	 SIM AA Co Police HQ 2	<a href="#">AA Co Police HQ</a>	
<input type="checkbox"/>	 SIM AA Co Police HQ 3	<a href="#">AA Co Police HQ</a>	
<input type="checkbox"/>	 SIM AA Cty 911 Center Monitor 1	<a href="#">AA Cty 911 Center</a>	
<input type="checkbox"/>	 SIM AA Cty 911 Center Monitor 2	<a href="#">AA Cty 911 Center</a>	
<input type="checkbox"/>	 SIM AA Cty 911 Center Monitor 3	<a href="#">AA Cty 911 Center</a>	
<input type="checkbox"/>	 SIM AA Cty EOC Monitor 1	<a href="#">AA Cty EOC Center</a> <a href="#">AA Cty 911 Center</a>	
<input type="checkbox"/>	 SIM AA Cty EOC Monitor 2	<a href="#">AA Cty EOC Center</a> <a href="#">AA Cty 911 Center</a>	

Figure 4-17. Display on Monitors (Select Monitors)

#### 4.6.6 Add Monitor Group

On the Add Monitor Group form, the Priority and Guaranteed Routes fields are removed.

## Add Monitor Group


**Name**

**Owning Organization**

**Monitors**

00copy  
00Copy of 00copy  
dfsgsdfgrds l:gpouruptoweirutpoier uptiouerotpdf  
SIM +DEVSOC MON 1 soc  
SIM +DEVSOC MON 2 soc  
SIM +DEVSOC MON 3 soc  
SIM +DEVSOC MON 4 soc  
SIM +iMPath Mon1 aoc  
SIM +iMPath Mon2 aoc  
SIM +NODE1 MON 1 node3  
SIM +NODE1 MON 2 node3  
SIM +NODE1 MON 3 node3  
SIM +NODE2 MON 1 node4  
SIM +NODE2 MON 2 node4  
SIM +NODE2 MON 3 node4  
SIM +NODE2 MON 4 node4  
SIM +TESTAOC MON 1 aoc  
SIM +TESTAOC MON 2 aoc  
SIM +TESTAOC MON 3 aoc  
SIM +TESTAOC MON 4 aoc

^  
v



**Site:**

Figure 4-18. Add Monitor Group

### 4.6.7 Monitor Group Details

On the Monitor Group Details page, the Priority and Guaranteed Routes fields are removed.

## Monitor Group: AOC North

### Status

[View Status Page](#)

### Configuration [\(Edit\)](#)

**Name:** AOC North

**Owning Organization:** AOC North

**Network Connection Site:** MonitorGroupFactory@localhost

**Monitors:**

- SIM AOC North Monitor 1
- SIM AOC North Monitor 2
- SIM AOC North Monitor 3
- SIM AOC North Monitor 4
- SIM AOC North Monitor 5
- SIM AOC North Monitor 6
- SIM AOC North Monitor 7
- SIM AOC North Monitor 8



[Back to Monitor Group List](#)

### Actions


The monitor group cannot be removed because there are monitors assigned to it. Remove the monitors from the group first.

**Figure 4-19. Monitor Group Details**

#### 4.6.8 Monitor Groups List

On the Monitor Groups List page, the Priority and Guaranteed Routes columns are removed.

**Monitor Groups (95)** [Add Group](#)











Name	Owning Organization
 <a href="#">+-- REMShop</a>	AOC
 <a href="#">+AOC lab</a>	AOC
 <a href="#">+BHT lab</a>	MDTA
 <a href="#">+DEVSOC lab</a>	SOC
 <a href="#">+FMT lab</a>	MDTA
 <a href="#">+iMPath lab</a>	MDTA
 <a href="#">+NODE1 lab</a>	SOC
 <a href="#">+NODE2 Lab</a>	District 4

Figure 4-20. Monitor Groups List


#### 4.6.9 Add Video Fabric

On the Add Video Fabric form, the Transmission Medium: Switch radio button is removed. The only remaining option is IP.

**Add Video Fabric**

Name

Owning Organization

Transmission Medium ☒ IP 

Site:

Figure 4-21. Add Video Fabric



#### 4.6.10 Video Fabrics List

On the Video Fabrics List page, the Switch Name column is removed.

**Video Fabrics (8)** [Add Video Fabric](#)



Name	Owned By	Medium
 <a href="#">+DUMMY Flash Only Fabric</a>	NOC	IP
 <a href="#">+MdTA Lab MPEG-2 Video fabric</a>	SHA	IP
 <a href="#">+SHA IP Fabric</a>	SHA	IP
 <a href="#">H.264 Fabric 1</a>	Allegany	IP
 <a href="#">H.264 Fabric 2</a>	Allegany	IP
 <a href="#">H.264 Video Fabric</a>	SHA	IP
 <a href="#">MdTA IP Video Fabric</a>	AOC	IP
 <a href="#">SHA IP Video Fabric</a>	SHA	IP

Figure 4-22. Video Fabric List

#### 4.7 ATMS-1968: Configuring Chart on the Web and Lane Closure Permit links ready for testing.

This section describes the changes to the CHART ATMS GUI for updating the CHART On The Web and Lane Closure Permit links. This change will configure both the CHART On The Web (<http://chart.state.md.us/>) and Lane Closure permits (<http://chartsyslcp1/LCP/>) links to redirect to their respective sites when clicked.

[Back](#) | [Forward](#) | [Refresh](#) | [Home](#) | [Center Kpt](#) | [Comm. Log](#) | [Instant Messaging](#) | [Info](#)

CHART Support :  
cnalla

Local Monitors: NO

INFO (All)


Events: 29

Resources


Alerts: 339

Map


Create Events




26




0



0



0



0

Traffic Events

Device Management

Operations Centers

Folders

General

Links

CHART MAP (Intranet)

CHART On The Web

EORS v2

Lane Closure Permit

Priority Events

SHA-DMTS

Administration

Name	Op Center	Regional	County/State
<a href="#">Incident @ 95 [Police Activity]</a> Location: 95	CHART Support	<input type="checkbox"/>	Baltimore County, MD
<a href="#">Incident @ 1 NORTH [Disabled In Roadway]</a> Location: 1 NORTH	CHART Support	<input type="checkbox"/>	Howard County, MD
<a href="#">Incident @ 695 NORTH PRIOR TO I95 [Weather Closure]</a> Location: 695 NORTH PRIOR TO I95	CHART Support	<input type="checkbox"/>	Baltimore City, MD
<a href="#">Incident @ 295 SOUTH AT PRATT ST [Vehicle Fire]</a> Location: 295 SOUTH AT PRATT ST	CHART Support	<input type="checkbox"/>	Baltimore City, MD
<a href="#">Incident @ 295 EAST AT RUSSEL ST [Police Activity]</a> Location: 295 EAST AT RUSSEL ST	CHART Support	<input type="checkbox"/>	Baltimore City, MD

Figure 4-23 Links configured for Testing

When we click on the CHART On the Web link it will redirect to page mentioned in Figure 4-23.

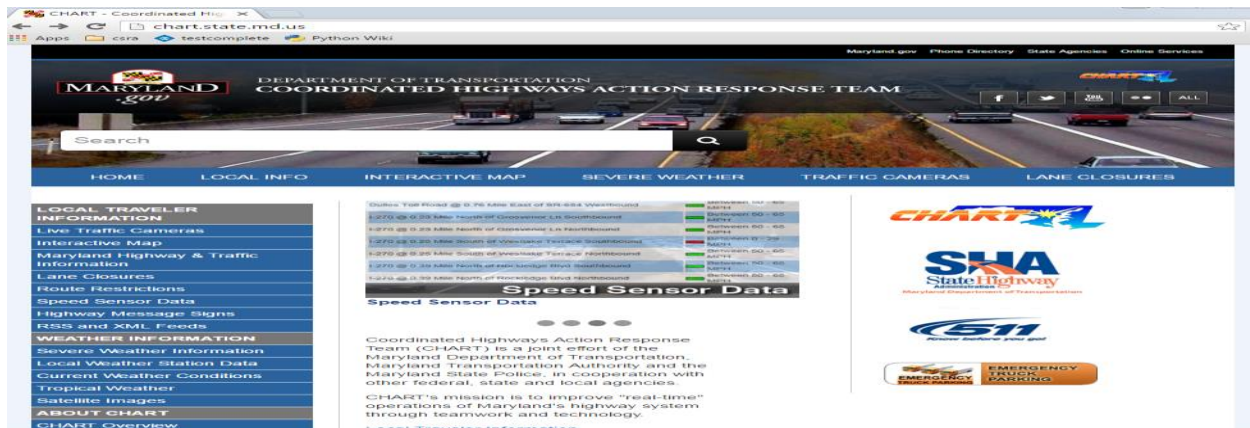


Figure 4-24 CHART On the Web page from ATMS

When we click on the Lane Closure Permits link it will redirect to the following page:

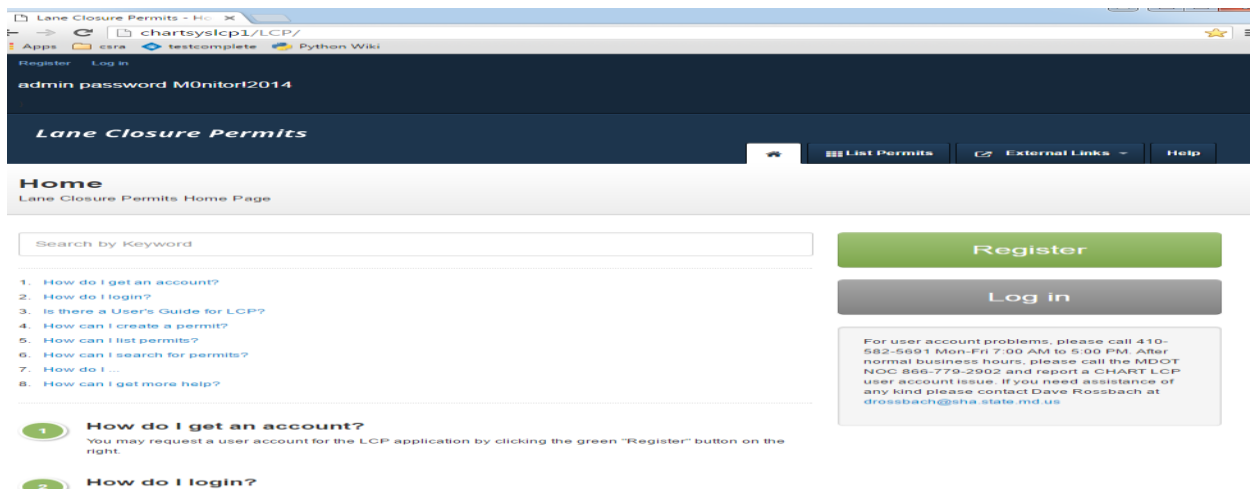


Figure 4-25 Lane Closure Permit from the ATMS

#### 4.8 ATMS-1973: Store GUI dynamic list objects in user session instead of TempObjectStore

This section describes the changes to the CHART ATMS GUI for storing the dynamic list state in the user's session. If the user clears the global filters for a list using the View All link, a Reset List link is displayed, allowing the user to reset the list to reapply the global filters. The Reset List link includes a description of the filters that would be restored, as shown below:

On/Off Devices (25) <a href="#">Add On/Off Device</a> <a href="#">Set Columns</a> <a href="#">(show default columns)</a>				
<a href="#">Reset List (Op Center Filter: SOC)</a>				
<a href="#">Device State (Actual)</a>	<a href="#">Status</a>	<a href="#">Last Update</a>	<a href="#">Route</a>	
--Any-- ▾	--Any-- ▾		--Any-- ▾	
Jnknown	Offline	02/25/16 12:13		

Figure 4-26 Reset List link

#### 4.8.1 System Profile: Web Settings

On the System Profile: Web Settings page, a new setting is added: Remember User's List Filter / Sort Criteria (Default Value):

Remember User's List Filter / Sort Criteria (Default Value) ☐

If checked, all dynamic list pages in the GUI will by default have their filter/sort criteria stored in the user's session so that it will be used the next time the user views the list again (by clicking on the link). This governs the default behavior, affecting all lists that are not already designated to participate. Enabling this could have undesirable consequences on some list pages, as there are many list pages in the system and some have custom functionality, so this is intended to be an experimental / test function.

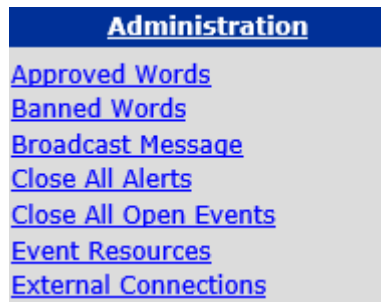
Figure 4-27 System Profile: Web Settings

### 4.9 ATMS-1978: Create special dev-only ability to close all alerts and traffic events

This section describes the changes to the CHART ATMS GUI for the development-only ability to close all alerts and traffic events. Not that this feature will not be visible in the production system as it will be controlled via a GUI properties setting and disabled for production boxes.

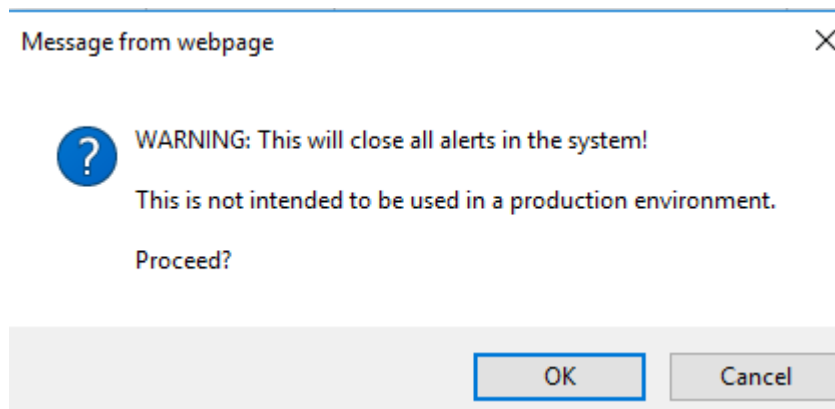
#### 4.9.1 Administration Menu

On the Home Page there are two links added: Close All Alerts and Close All Open Events:



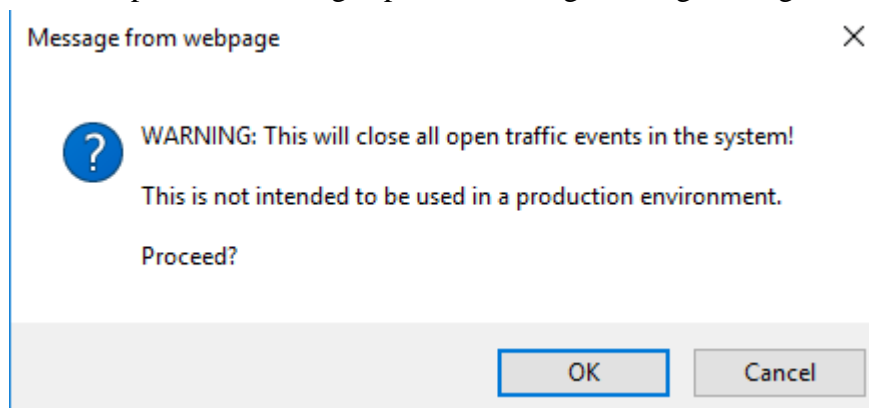
**Figure 4-28 Administration Menu**

Clicking on the Close All Alerts link brings up the following warning message / confirmation box:



**Figure 4-29 Close All Alerts Warning**

Clicking on Close All Open Events brings up the following warning message / confirmation box:








**Figure 4-30 Close All Open Events Warning**

This section deals with the removal of DMS Protocols from the ATMS code base to reduce code complexity and improve maintainability. Since SHA and MDTA decided to utilize NTCIP for DMSs, there are six protocols in ATMS that have become obsolete. The DMS models that use these protocols are selectable while adding a DMS, changing a DMS, and in Highway Message Signs List (Model column) as shown in the below figures respectively.

**Figure 4-31 Models when adding DMS in R16**

### Figure 4-32 Models when changing DMS in R16

Highway Message Signs (380) <a href="#">Add DMS</a> <a href="#">Set Columns</a> <a href="#">show</a>				
Show: <input checked="" type="checkbox"/> CHART DMSs <input checked="" type="checkbox"/> External DMSs				
External Agencies: <input checked="" type="checkbox"/> VDOT_NOVASTC				
Filters: External Agencies: VDOT_NOVASTC				
Description  / Location	Model	Message	Beacons	Status
 +FP1001 ISDN	--Any--	--Any--	--Any--	--Any--
 +FP2001 Dir 14	No Entry		OFF	Maintenance Comm. Failed
 +FP2001 ISDN	FP1001		OFF	Online
 +FP9500 ISDN	FP2001		OFF	Online
	FP9500		OFF	Offline Comm. Failed
	NTCIP			
	PCMS			
	SYLVIA			
	TS3001			

**Figure 4-33 Models displayed in HMS list (Model column) in R16**

In R17, the models will be limited to only NTCIP and FP9500. The following Figures display the values with updated protocols in ATMS GUI. The following figures describe adding a DMS, changing DMS and model column of Highway Message Signs respectively.

<a href="#">Toggle Menu</a>   <a href="#">Recent Events</a>   <a href="#">Back</a>   <a href="#">Forward</a>   <a href="#">Refresh</a>   <a href="#">Center Rpt</a>   <a href="#">Comm. Log</a>   <a href="#">Instant Messaging</a>   <a href="#">Home Page</a>	
<b>Add DMS</b>	
<b>General DMS Information</b>	
Name	<input type="text"/>
Owning Organization	-- Select --
Maintaining Organization	-- Select --
Enable Device Logging	<input type="checkbox"/>
Decision Support Eligible	<input checked="" type="checkbox"/>
Model	-- Select --
Display Configuration	<div> <div>FP9500</div> <div>NTCIP</div> </div>
Travel Time Msg Arb Queue Level	Travel Time
Toll Rate Msg Arb Queue Level	Toll Rate
Date Commissioned	08/31/2016
Managed Export	<input type="checkbox"/>
<b>Alert and Notification Settings</b>	
Operations Center to alert on Comm Failure:	None
Operations Center to alert on Hardware Failure:	None
Notification groups to notify on Comm Failure:	--Select to Add--
Notification groups to notify on Hardware Failure:	--Select to Add--
Location <a href="#">(Edit)</a>	

**Figure 4-34 Models when adding DMS in R17.**

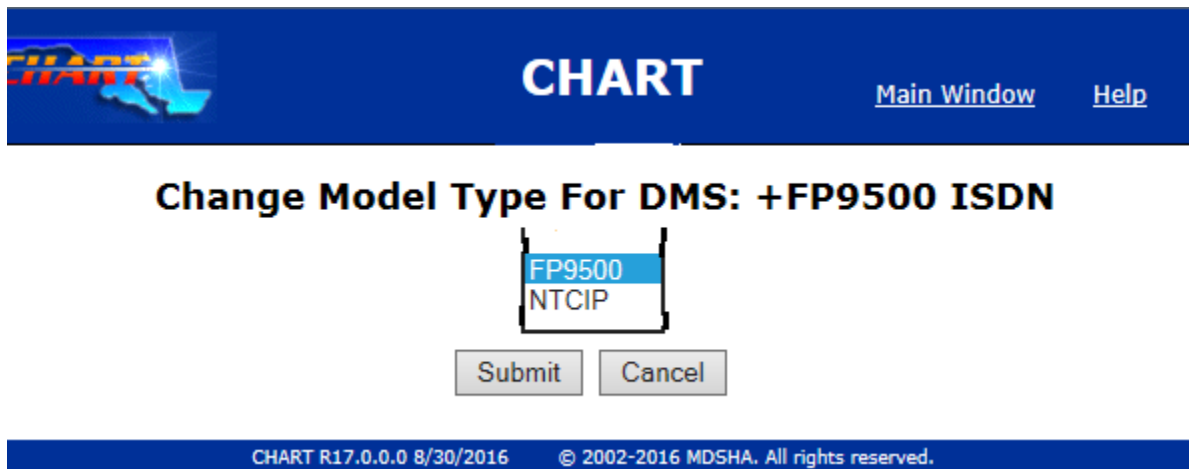


Figure 4-35 Models when changing a DMS in R17

**Highway Message Signs (380)** [Add DMS](#) [Set Columns](#) [show](#)

Show: ☒ CHART DMSs ☒ External DMSs  
 External Agencies: ☒ VDOT\_NOVASTC

Filters: External Agencies: VDOT\_NOVASTC

Description  / Location	Model	Message	Beacons	Status
+FP1001 ISDN	--Any-- No Entry FP9500 NTCIP	--Any--	--Any--	--Any--
+FP2001 Dir 14	FP9500		OFF	Maintenance Comm. Failed
+FP2001 ISDN	FP9500		OFF	Online
+FP9500 ISDN	FP9500		OFF	Online
+FP9500 ISDN	FP9500		OFF	Offline Comm. Failed

Figure 4-36 Models displayed in HMS list (Model column) in R17

Last of chapter 4

## 5 DETAILED DESIGN

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### 5.1 Hardware Detailed Design

There is no new hardware (servers, devices, etc.) deployed that is related to ATMS R17.

### 5.2 Software Detailed Design

#### 5.2.1 Key Design Concepts

##### 5.2.1.1 *WO9 PRs*

##### 5.2.1.1.1 ATMS-612: JavaScript caching issues following deployments

There are no significant design decisions related to this issue. Changing the URLs to prevent the browser from continuing to cache the JavaScript / CSS files will be done by the build / installer / deployment process and will not affect the code at all.

##### 5.2.1.1.2 ATMS-847: DMS\_TRAV\_ROUTE\_MSG\_MSGS\_LOG data not deleted from archive DB

There are no significant design decisions related to this issue.

##### 5.2.1.1.3 ATMS-869: LevA 1108 TRAVEL\_ROUTE\_CONSUMER database records not cleaned up

When a travel time or toll rate message is enabled on a DMS, the DMS is added as a consumer of the travel routes used in the message so it will get data updates for those travel routes. When the travel time/toll message is disabled on the DMS, the DMS calls the Travel Route Service to indicate that it is no longer a consumer. The update to the list of travel route consumers however currently remains in-memory and is not persisted to the database. Server-side functionality will be added to the DMS Control Module whenever invoked to update the list of DMS and Travel Routes consumers. This correction will also address executing a clean up database script to the TRAVEL\_ROUTE\_CONSUMER table for any DMS's which are no longer identified as consumers of travel routes.

##### 5.2.1.1.4 ATMS-882: Add Banned Pronunciation word to Dictionary displays wrong text.

There are no significant design changes for this PR. Currently, when adding a banned word to TTS pronunciation displays a velocity error message in the GUI i.e. "\$util.escapeHTML(\$text) " instead of a descriptive error message. After the change, the TTS Pronunciation Page will be



corrected to account for the missing text instead of displaying the velocity error message in the GUI.

#### **5.2.1.1.5 ATMS-888: Inconsistent Date Formats in CHART Log files.**

Currently, in the CHART system log files are displayed in two different formats i.e. an MM/DD/YY and YYYY/MM/DD format which complicates the readability of the log messages. This PR deals with changing the Date format to use the YYYY/MM/DD format system-wide.

After this change, all ATMS-generated log files in the system will have consistent date formats and should be verified. For instance, on chartsysappl application server, navigate to “E:\Program Files\<CHART ATMS VERSION>\bin\<SERVICE NAME>\<servicename\_date.txt>”.

The following services will have new date format in the log files:

AlertEventService, AlertService, DMSEventService, DMSService, EventService, EORSService, HAREventService, HARService, INRIXImportService, MsgUtilityEventService, MsgUtilityService, NotificationEventService, NotificationService, OnOffDeviceEventService, OnOffDeviceService, RITISEventService, RoadwayLocationLookupEventService, RoadwayLocationLookupService, ScheduleEventService, ScheduleService, TradingService, TrafficEventEventService, TrafficEventService, TrafficRouteEventService, TSSEventService, TSSService, UserMgrEventService, UserMgrService, VideoEventService, VideoService, WatchdogService1, WatchdogService2.

#### **5.2.1.1.6 ATMS-1239: Create a Capability to set Comm Loss Timeouts for Multiple DMSs**

The ability to save comm loss timeout backups will be handled by the GUI using the System Profile (rather than introducing management functionality in the IDL and DMS Service and adding new database tables for this information). The only new server-side functionality added to the DMS factory is the ability to set the comm loss timeout for multiple DMSs, which will be invoked during both the Set and Restore operations. Since this is a long-running operation, a CommandStatus will be used to keep track of the progress.

#### **5.2.1.1.7 ATMS-1526: NTCIP Camera details page spelling from maximimun to Maximum.**

There are no significant design changes for this PR. A correction to the spelling in the template of NTCIP Camera Details Page will be made.

#### **5.2.1.1.8 ATMS-1685: Trigger Condition units field not blanked upon editing.**

There are no significant design changes associated with this PR. In current ATMS system, when a trigger condition which contains a non blank units' fields such as Miles, MPH, °F etc. is edited

or replaced with a different condition with a blank field, the value in units' field is not replaced. In this section, we will clear the units' field values when there is a blank units' field replacement. There will be no change in the GUI VM template since the units' field for trigger conditions is correctly displaying blank and non-blank values. Changing the server side code will handle the changes to the unit's field value when alternating from non blank to blank and vice versa.

#### **5.2.1.1.9 ATMS-1861: Unused service(s) installed as Automatic**

There are no significant design changes associated with this PR. Un-used services will be installed as disabled within the ATMS installation scripts.

Currently, the MDTATravelTimeImportService is not used in the lab, but is also installed as automatic in lab environments. This service will be installed in Manual mode by default to prevent the service from being started when server restart occurs or by CM verification.

#### **5.2.1.1.10 ATMS-1891: Upgrade JW Player version to match Cweb**

There are no significant design decisions related to this issue. The portion of the code that interacts with JWPlayer is encapsulated in a single JavaScript file that may need to be modified.

#### **5.2.1.1.11 ATMS-1909: CHART-ES copy jobs need to be in transaction block**

There are no significant design decisions related to this issue.

#### **5.2.1.1.12 ATMS-1940: updates for CHART services on new current training system**

There are no significant design changes associated with this PR. This involves updating CHART services on the new current training system. The StartAllServices.cmd script generated for the new current Training system in the lab (charttrnlabapp1) currently attempts to start the RITISServices and RITISEvents services. These services will now be installed as disabled. As referenced in ATMS-1861, the MDTATravelTimeImportService will be installed as Manual by default for this lab installation.

On the mapping server (charttrnlabmap1 and charttrnmap01) the watchdogs will now be installed as Automatic from the previous Manual configuration. These are the updates which will be applied to the chart services in the training system environment.

#### **5.2.1.1.13 ATMS-1942: Remove ATMS installer config files for chartsys2\* and chartdevapp1 servers**

There are no significant design decisions related to this issue. There are installation files in the ATMS code base related to unused servers. This PR will remove all the files related to chartsys2\* and chartdevapp1 servers to cut down on maintenance of dead code.

#### **5.2.1.1.14 ATMS-1959: Update Lufft export jobs**

There are no significant design decisions related to this PR. The script that creates the CHART export jobs in Lufft will be updated to not include special characters, such as degree symbol to the column header of the exported weather data files.

#### **5.2.1.1.15 ATMS-1963: Create Build Profile For Training Servers**

There are no significant changes to this PR. The server installation scripts for the Training Servers: charttrnlabapp1 and charttrnlabmap1 will be updated in the ATMS installation scripts. In addition, the missing installation script for charttrnlabweb1 and charttrnlabmap1 will be added.

#### **5.2.1.1.16 ATMS-1966: Remove obsolete directories / files from the ATMS codebase**

The decision to keep the Video Fabrics (rather than removing them and just using encoder model and/or compression type to determine compatibility between video sources and monitors) allows for more flexibility when configuring cameras and monitors. For example, there might be cases where different models of encoders / decoders are compatible when both are using H.264 compression, and other cases where different models are incompatible. There could also be current or future business rules for not wanting some cameras to be displayed on some monitors, even though they are technically compatible. So a camera will only be displayable on a monitor if the camera has a sending device that is on the same video fabric as the video fabric configured for the monitor's decoder. The selection lists that are shown when displaying a camera on multiple monitors, and when selecting a camera to display on a monitor, will be changed to show only the devices with matching video fabrics. The downside of the extra configurability is that there is currently no validation enforcing that encoder / decoder models and compression types match other cameras / monitors on the video fabric. In other words, it is all up to the administrator to ensure that all devices on the fabric are compatible. Video fabrics are not currently attributed with an intended compression type or supported encoder/decoder models to enforce such a validation rule, and that might be an idea for future improvement to add those fields, but it is not within the scope of this PR.

Since Video Fabrics were hosted by the VideoSwitchModule, and video switches will be removed from the system, the Video Fabric functionality will be moved to a new VideoFabricModule for cleanliness.

#### **5.2.1.1.17 ATMS-1967: Keep track of stats / report of which GUI actions have been invoked**

The database will be used to store the usage statistics, as database records are not so easily deleted as flat files, and this will allow the long term usage of various requests to be tracked more reliably across future releases. The database is also more easily used for queries, as opposed to a flat file which would need to be parsed and manipulated somehow. The data will be included when backups are done, and over time the production data will be readily available for developers and testers to look at when the production database is migrated to the lab.

To reduce the possibility of race conditions when incrementing the counts between two GUI instances (such as the main GUI instance and SWGI), each instance will query the counts from the database just before incrementing them. This method of synchronization is not perfect, but it doesn't matter too much if two GUI instances occasionally overwrite each others' counts. This feature is just to get an overall sense of how much (or how little) certain features are used.

Since this information is GUI-specific, it is not really appropriate to add functionality to the IDL just to write to the database. Database access will be done directly by the GUI. There is precedent for this, in that the GUI currently accesses the database directly for CHART folders and the Shift Handoff Report.

#### **5.2.1.1.18 ATMS-1968: Configuring CHART On The WEB and Lane Closure Permits links configurable for testing.**

There are no significant design decisions associated with this issue. The Links created in the GUI are not functional for Testing, configuring those links to appropriate URL's for Testing. Adding installer-configured parameter for the links to each webserver install script.

#### **5.2.1.1.19 ATMS-1969: Move Native C++ To Standalone Project**

There are no significant changes to this PR. The goal of this PR is to limit the need for multiple developers and users requiring the Visual Studio IDE to build the native C++ projects within the ATMS application. The formally built DLLs for the native C++ projects will be deployed within the CHART\_Build\_COTS directory of the ATMS baseline.

#### **5.2.1.1.20 ATMS-1973: Store GUI dynamic list objects in user session instead of TempObjectStore**

The definition of this PR is already at design level. The goal is to allow users to maintain the list filtering and sorting state so they can continue their work and see the list pages as they previously wanted them displayed if they have to leave a list page and return to it again. Prior to R17 they would need to use the Back link/button to retain filtering / sorting instead of clicking on the link to the list again, as clicking on the link would create a new dynamic list object and cause them to lose the sorting / filtering.

Rather than create a new dynamic list object each time they click a link, storing the dynamic list object in their user session allows the list to retain its state as long as the user is logged in.

There are some lists that have global filters applied, however, and there is no way to get back to the original state if those filters are cleared. For example, each of the device lists (DMSs, HARs, Cameras, etc) is initially filtered by Op Center Filter which shows objects only if they are in the operations center's folder or AORs. It is possible for the user to clear that global filter by clicking on the View All link, but it is an irreversible change: there is no way of reapplying the global filter without clicking on the link to view the list again. In R17, if the global filters are cleared, a new Reset List link will appear that will allow the user to get back to the original state – the global filters, filtering, and sorting will be reset to the original state.

There are many dynamic lists in the system, and there may be other cases where re-using the list could cause unintended consequences. (For example, selection lists such as the one being added for ATMS-1239 for selecting multiple DMSs, which stores the selections in the list object). Therefore, lists will by default not use the new functionality unless they are well tested on a case by case basis. These lists will remain as they were before, stored in the TempObjectStore.

As an experimental option, in the System Profile there will be a setting to change the default behavior, making all lists use the user's session (except when global filters are cleared). This will be helpful in testing new lists, or it may prove that it is OK to enable this feature for all lists.

#### **5.2.1.1.21 ATMS-1975: TOLL\_DATA\_IMPORT in production CHART\_Live DB not being cleaned up**

There are no significant design decisions related to this issue.

#### **5.2.1.1.22 ATMS-1976: Improve ATMS Demo**

The current stand-alone ATMS Demo involves a document guided approach of installing and configuring the pre-requisite software for the application demo. Batch scripts will be implemented to automate the installation of the SQL Server 2012 Express 64bit database and the Java JRE 8.0.74 32bit and 64bit versions. Additional batch scripts are used to automate the creation and population of the ATMS CHART\_Live database, automate the Apache Tomcat 8.0.30 post-installation steps, and the silent installation and configuration of the CHART ATMS services/webservices. The automated batch script for database population of the ATMS Demo database will also include an additional script to specifically insert a set number of pre-defined CHART data objects for use in the demo application. The following types of data will be added to the database initialization scripts in limited quantities:

- DMS Devices
- HAR Devices
- SHAZAM Devices
- Camera Devices
- Monitor Devices
- TSS Devices

- On/Off Devices
- Notification Contacts
- Call Out Lists
- Message Libraries
- Response Plans
- Travel Routes

#### **5.2.1.1.23 ATMS-1978: Create special dev-only ability to close all alerts and traffic events**

The closing of all alerts and / or events is not intended to be used in a production system, so it will be controlled via a GUI properties file setting and set by the installer depending on which environment it is installed on.

If this setting is accidentally changed, or if it becomes desirable to use in a production setting at some point, it will also be protected by a right.

The Configure System right will be used, as inventing new rights for a feature that is not intended for production use seems unnecessary and might cause some confusion. The feature would be an administrative-level function if it were for some reason ever used in production as well, requiring the highest level of access.

#### **5.2.1.1.24 ATMS-1979: Clean up obsolete user rights.**

There are no significant design decisions related to this issue. There are unused user rights in the FunctionalRightType Java class, removing those rights from that class and its sub-classes will reduce maintenance of dead code.

#### **5.2.1.1.25 ATMS-2021: Remove obsolete DMS Protocols**

There are no significant changes to this PR, it will only reduce code complexity and improve code maintenance of the ATMS system. There are currently six DMS protocols which are not used for very long time. The Protocols to be removed are as follows.

- Addco - Originally implemented in CHART 1 by JHK in 1996, Implemented in CHART II by CSC / PBFI in 1999.
- FP1001- Originally implemented in CHART 1 by JHK in 1995, Implemented in CHART II by CSC / PBFI in 1999.
- FP2001 – Originally implemented in CHART 1 by JHK in 1995, Implemented in CHART II by CSC / PBFI in 1999.
- PCMS (Display Solutions) - Implemented in CHART II by CSC / PBFI in 2000.

- Sylvia - Implemented in CHART II by CSC / PBFI in 1999.
- TS3001 - Originally implemented in CHART 1 by JHK in 1995, Implemented in CHART II by CSC / PBFI in 1999.

There are no DMSs defined in the CHART system. All of the DMSs currently in ATMS are using NTCIP or FP9500 models only.

#### **5.2.1.1.26 ATMS-2022: Modify Automatic Weather Messages to Log Device Activations/Deactivations Similar to Travel Time Messages**

There is a need to collect information about DMS Triggered Messages so that, at a later time, we can determine what DMS Triggered Messages were displayed or not displayed at a given point in time. This is similar to information currently logged about DMS Travel Time Messages.

Information about Triggers and DMS Triggered Messages will now be logged directly to the CHART\_LIVE database and archived after a specified time. These messages will only be available by directly querying the database and could be utilized in future reporting by the UMD-developed Reporting Tool.

The information logged will consist of DMS Triggered Message Configuration Information, DMS Triggered Message Status Information, Trigger Configuration Information and Trigger Status Information.

DMS Triggered Message Configuration information includes information that is displayed on the DMS Details page in the Triggered Message section. Information will be logged when:

- Enabling or Disabling a Triggered Message on a DMS
- Adding or Removing a Triggered Message on a DMS
- Editing a Triggered Message on a DMS

DMS Triggered Message Status information includes information that is displayed on the DMS Details page Triggered Message section that represents status. Information will be logged when:

- Comm loss occurs.
- A Triggered message was pre-empted by a higher priority message
- A sign is blanked
- Operational Status changes
- Communication Mode changes
- A message on sign changes due to a trigger no longer being activated

Trigger Configuration Information includes information that is displayed on the Trigger Details page. Information will be logged when:

- Enabling or Disabling a Trigger
- Adding or Editing a condition to a Trigger
- Enabling or Disabling a Trigger condition
- Editing a Trigger condition

Trigger Status Information includes information that is displayed on the Trigger Details page that represents status. Information will be logged when:

- Any Trigger evaluation results in the trigger moving into or out of the Active state.  
Note: Triggers are evaluated when sensor data is updated but also after any trigger configuration changes.

## 5.2.2 Packaging

### 5.2.2.1.1 CHART ATMS

This software design is broken into packages of related classes. Table 5-1 shows each package that is new or changed to support the Release 17 features.

**Table 5-1. CHART ATMS Packages**

Package Name	Package Description
chartlite.data.dms	GUI DMS-related data classes (removing models for ATMS – 2021)
chartlite.data.video	GUI video functionality (obsolete code removed for ATMS-1966)
chartlite.servlet	GUI main servlet classes (code to track GUI actions added for ATMS-1967; changes for dynamic lists for ATMS-1973)
chartlite.servlet.alerts	GUI alerts functionality (new request for ATMS-1978)
chartlite.servlet.db	GUI database classes (code to track GUI actions added for ATMS-1967)
chartlite.servlet.dictionaries	Handles user requests for dictionaries. (Error message changed for ATMS-882)
chartlite.servlet.dms	GUI request handling for DMS requests (adding the ability to set comm loss timeouts for multiple DMSs for ATMS-1239)
chartlite.servlet.dynlist	GUI dynamic list classes (changes for ATMS-1973)
chartlite.servlet.trafficevents	GUI traffic event functionality (new request for ATMS-1978)
chartlite.servlet.video.network	GUI video functionality (obsolete code removed for ATMS-1966)
chartlite.servlet.video.sink	GUI monitor functionality (obsolete code removed for ATMS-1966)
chartlite.servlet.video.source	GUI camera functionality (obsolete code removed for ATMS-1966)
CHART2.CameraControlModule	Server-side camera functionality (obsolete code removed for ATMS-1966)
CHART2.DMSControl	DMS-related IDL classes (removing models for ATMS – 2021)
CHART2.DMSControlModule	Server-side DMS implementation classes (adding the ability to



	set comm loss timeouts for multiple DMSs for ATMS-1239; changes for ATMS-2022)
CHART2.MonitorControlModule	Server-side monitor functionality (obsolete code removed for ATMS-1966)
CHART2.RouterControlModule	Server-side router functionality (removed for ATMS-1966)
CHART2.TriggerModule	Server-side trigger classes (changes for ATMS-2022)
CHART2.VideoFabricModule	Server-side video fabric classes (new for ATMS-1966)
CHART2.VideoSwitchModule	Server-side switch functionality (removed for ATMS-1966)
CHART2.Utility	Utility functionality. (Includes functional rights removed in ATMS – 1979; system profile settings added for ATMS-1239)
/interfaces/xsd/UserManager/UserManager.xsd	UserManager service includes enumerated values defined in FunctionalRightsType will be removed in ATMS – 1979.

### 5.2.3 Assumptions and Constraints

#### 5.2.3.1 ATMS-612: Javascript caching problems after deployment

1. Assumption: The use of a URL rewrite filter will not significantly impact the performance of the ATMS GUI. (It would be easy to back out the change if it does).
2. Constraint: Users will need to clear their browser caches once after deployment of this PR, to remove Javascript files already cached pre-R17.

#### 5.2.3.2 ATMS-1891: JWPlayer upgrade

1. Assumption: The new version of JWPlayer supports all functionality used in the ATMS GUI
2. Assumption: The new version of JWPlayer can be configured to not call out to the Internet (for Google Analytics), or at least can display video if such calls fail. (Needed for lab and software support via production VPN).

#### 5.2.3.3 ATMS-1969: Move Native C++ to Standalone Project

1. Assumption: Visual Studio 2012 Ultimate IDE will continue to be installed and used on build server and developer environment centered to maintain and deploy the standalone C++ project.

#### 5.2.3.4 ATMS-1976: Improving ATMS Demo

1. Assumption: The ATMS Demo will continue to be installed on a compatible environment: Windows Server 2008 R2 or Windows 7, 64bit processor, 16GB RAM, and 100GB free for database and application.
2. Assumption: System prerequisites for Microsoft SQL Server 2012 Express and for CHART ATMS should be installed previously on the intended system: .NET Framework 3.5 SP1 and Internet Explorer 10+.
3. Assumption: Administrator privileges are required for installation of all prerequisite software.
4. The following operations and actions in the ATMS Demo are assumed to not be available or supported:

- i. Permit Importing
- ii. External Weather Data
- iii. Decision Support Suggestion
- iv. Close Devices Map
- v. Notification (Email) Service
- vi. External Events (RITIS)
- vii. Areas Of Responsibility
- viii. Traffic Signals

#### ***5.2.3.5 ATMS- 2021 Removing Obsolete DMS Protocols***

1. Assumption: By removing these DMS Protocols doesn't affect any other existing Protocols. Since, MDSHA have made NTCIP as standard to use DMS and these Protocols have not been used for very long time.

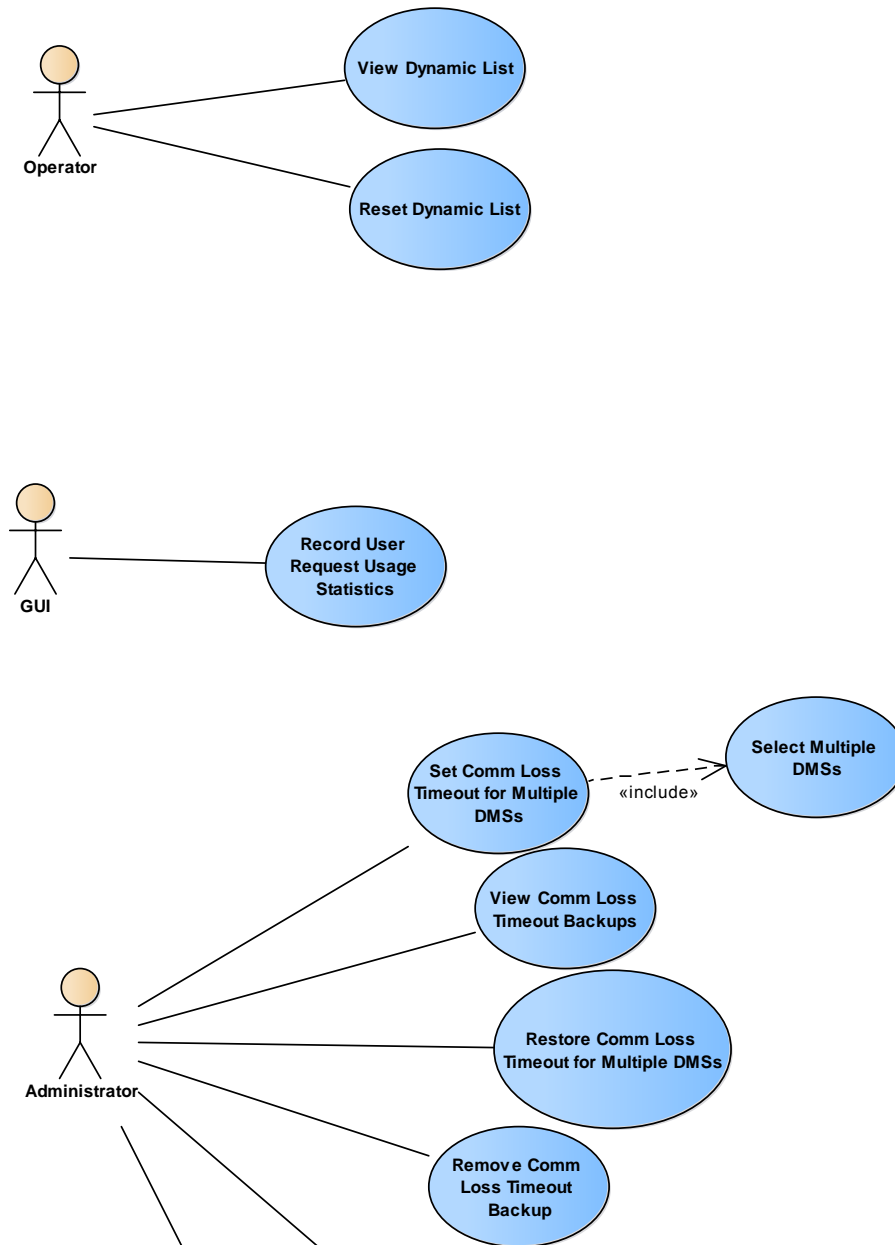
## **5.2.4 Use Case Diagrams**

The Use Case Diagrams (UCDs) below depict new and modified functionality for CHART ATMS R17. The use case diagrams exist in the Enterprise Architect design tool in the chartdesign project, under the CHART-ATMS-R17 folder.

### **5.2.4.1 R17 Use Cases UCD**

This diagram shows use cases for R17 changes.

uc R17 Use Cases



**Figure 5-1. R17 Use Cases (UCD)**

#### **5.2.4.1.1 Close All Alerts (In Development / Lab Environment)**

The system will allow a user with the Configure System right to close all open alerts in the system, if the feature is enabled in the GUI properties file. The system will display a confirmation warning stating that this function should not be run in a production environment. (The feature will not be enabled for production GUI instances, only for development and lab usage). See ATMS-1978.

#### **5.2.4.1.2 Close All Open Traffic Events (In Development / Lab Environment)**

The system will allow a user with the Configure System right to close all open traffic events in the system, if the feature is enabled in the GUI properties file. The system will display a confirmation warning stating that this function should not be run in a production environment. (The feature will not be enabled for production GUI instances, only for development and lab usage). Traffic events without sufficient data entered to close normally will be closed as false alarms. See ATMS-1978.

#### **5.2.4.1.3 Record User Request Usage Statistics**

The ATMS GUI will record statistics in the database for which request actions are invoked by users (and which are not), to assist in determining which functionality is used most and which may be obsolete. Information will include: action name, request handler short name, request handler class name, first known action registration time, last invocation time, and invocation count. The GUI will update the stats soon after startup to record any new actions that are registered, and will periodically update the usage statistics as actions are invoked. Configuration settings will include a flag for enabling/disabling the functionality on a per-instance basis, and a persistence interval. See ATMS-1967.

#### **5.2.4.1.4 Remove Comm Loss Timeout Backup**

The system will allow a user with the Configure DMS, Maintain DMS, and Manage Device Comms rights to remove a Comm Loss Timeout backup record. See ATMS-1239.

#### **5.2.4.1.5 Reset Dynamic List**

If a user viewing a dynamic list with global filters clears the global filters via the View All link, the system will display a Reset List link which includes a description of the global filters that were cleared. The system will allow the user to reset the list, generating a new list with global filters applied. Any prior filtering / sorting will also be reset (reverting to default) if this action is performed. See ATMS-1973.

#### **5.2.4.1.6 Restore Comm Loss Timeout for Multiple DMSs**

The system will allow a user with the Configure DMS, Maintain DMS, and Manage Device Comms rights to restore the Comm Loss Timeouts for multiple DMSs from a backup record. See ATMS-1239.

#### **5.2.4.1.7 Select Multiple DMSs for Comm Loss Timeout**

The system will allow a user setting the comm loss timeouts for multiple DMSs to select the applicable DMSs using a sortable and filterable multi-select list that includes the DMS name, location, current message, and device status. The list will be initially filtered to show non-blank DMSs. The system will allow the user to filter the list by current message type and device status. The user will be able to select individual DMSs and then filter the list, and the selections made prior to filtering will be retained. See ATMS-1239.

#### **5.2.4.1.8 Set Comm Loss Timeout for Multiple DMSs**

The system will allow a user with the Configure DMS, Maintain DMS, and Manage Device Comms rights to change the Comm Loss Timeout for multiple DMSs. The system will allow the user to save a backup record of the original timeouts for the selected DMSs (along with the username, op center name, date/time of the backup, and an optional user-specified comment field) to allow the comm loss timeouts to be restored at a later time. See ATMS-1239.

#### **5.2.4.1.9 View Comm Loss Timeout Backups**

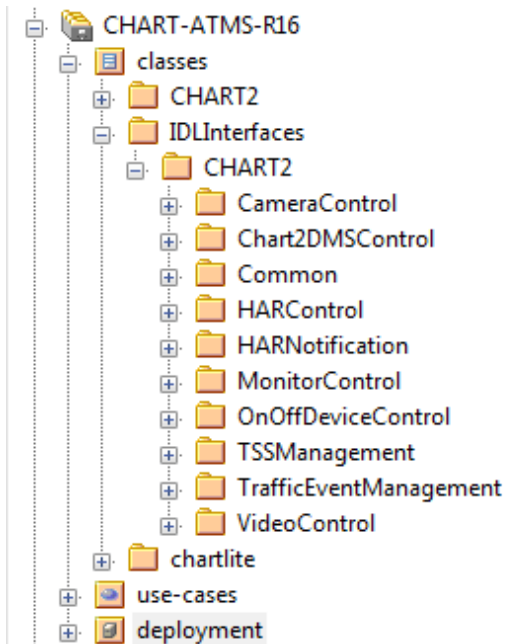
The system will allow a user with the ConfigureDMS, MaintainDMS, and ManageDeviceComms rights to view the list of comm loss timeout backup records for the purpose of invoking the Restore and/or Remove actions. The information shown for each backup record will include the username, op center, date/time, DMSs included, and optional comment. See ATMS-1239.

#### **5.2.4.1.10 View Dynamic List**

The user will be able to view dynamic lists. If a particular list supports it, the dynamic list will be saved in the user's HTTP session data in R17 so it can be reused as long as the user is logged in, preserving any filtering and sorting criteria that were previously applied by the user. Lists that do not support being stored in the user's session will continue to be stored in the TempObjectStore, so their behavior will not be changed. To avoid possible unintended usability issues, lists will by default NOT be stored in the user's session but can "opt in" on a per-list basis. (The default behavior will be adjustable via system profile). Lists accessible from the main menu will be the first to support this new mechanism. See ATMS-1973.

### 5.2.5 System Interfaces Design (IDL)

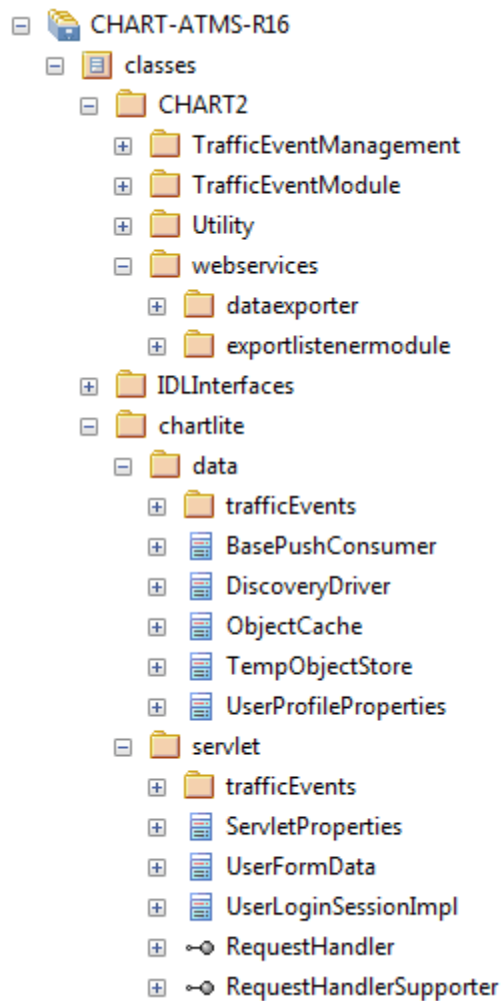
For convenient viewing, new and modified IDL designs are included in a separate document for viewing with a browser. Unzip the file CHART-ATMS-R17-Design-HTML.zip. Open the file index.htm in the top-level directory. See the example below for where to find links to the IDL class diagrams.



**Figure 5-2. Where to Find IDL Interfaces Classes in HTML Design**

### 5.2.6 Package Designs

For convenient viewing, new and modified package designs are included in a separate document for viewing with a browser. Unzip the file CHART-ATMS-R17-Design-HTML.zip. Open the file index.htm in the top-level directory. See the example below for where to find links to the classes for CHART2 (server) diagrams and chartlite (GUI) class diagrams.

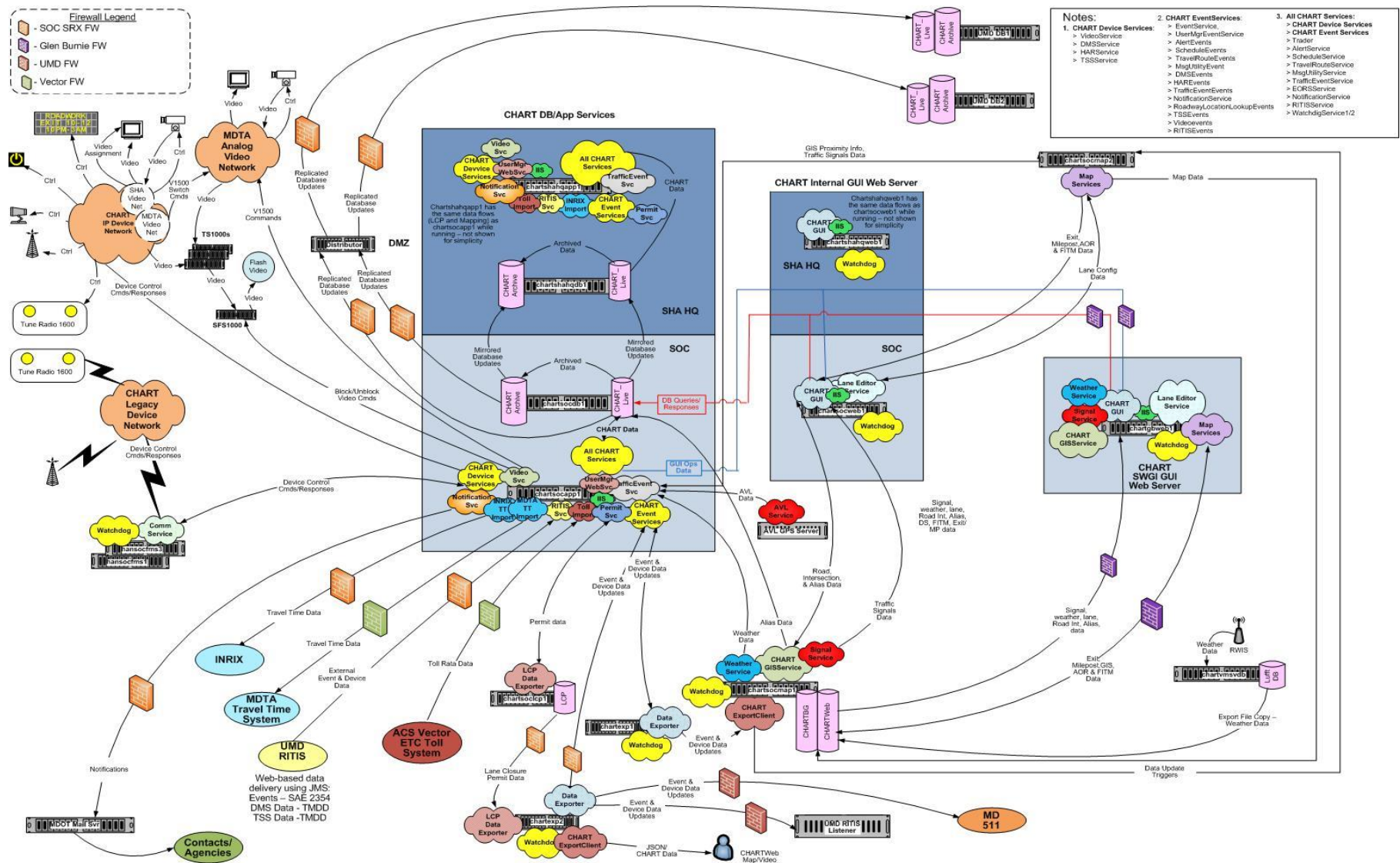


**Figure 5-3. Where to Find CHART2/chartlite Classes in HTML Design**



### **5.3 Internal Communications Detailed Design**

The following diagram depicts the high level communications/interactions among ATMS and other CHART and external components.



5-4 CHART ATMS Detailed Data Flow

<<You can describe interfaces in more detail here if needed>>

## 6 EXTERNAL INTERFACES

This section describes the external interfaces being added or modified in Release 17 of CHART ATMS. See Figure 6-1.

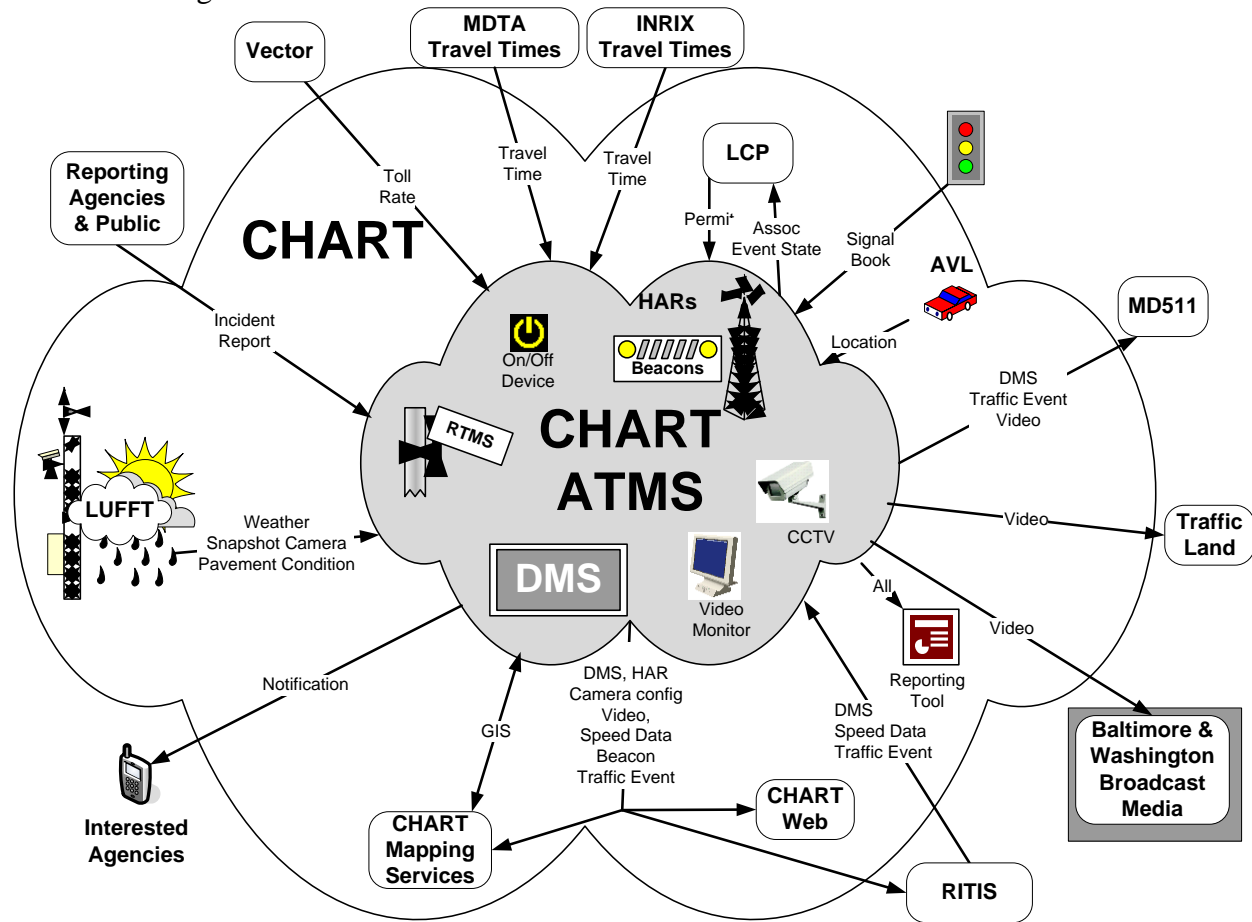


Figure 6-1. CHART and External Interfaces

### 6.1 Interface Architecture

For ATMS R17, there are no changes to the external interfaces.

### 6.2 Interface Detailed Design

For ATMS R17, there are no changes to the external interfaces.

## **7 SYSTEM INTEGRITY CONTROLS**

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This section describes the security and integrity controls being added or modified in Release 17 of CHART ATMS. Features being added for CHART ATMS Release 17 do not change security aspects of the CHART ATMS.

## APPENDIX A. MAPPING TO REQUIREMENTS

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The table below shows how the new and modified requirements in the CHART R17 Requirements document map to design elements contained in this design.

*Table A-1. Mapping to Requirements*

Requirements Doc Use Case / PR	Description	Features	Design Use Case	Other Design Elements
ATMS-612	JavaScript caching issues following deployments	N/A	N/A	NONE
ATMS-847	LevA00001002 DMS_TRAV_ROUTE_MSG_MSG S_LOG ; Not deleting the data after 90 days from c2arch3 database.	N/A	N/A	NONE
ATMS-869	LevA00001108 TRAVEL_ROUTE_CONSUMER database records not cleaned up	N/A	N/A	NONE
ATMS-882	LevA00001168 Add Banned Pronunciation Word to Dictionary displays wrong text	N/A	N/A	HMI screenshot
ATMS-888	LevA00001179 Inconsistent Date Formats in CHART Log Files	N/A	N/A	HMI screenshot

Requirements Doc Use Case / PR	Description	Features	Design Use Case	Other Design Elements
ATMS-1239	Create a Capability to set Comm Loss Timeouts for Multiple DMSs	N/A	Set Comm Loss Timeout for Multiple DMSs, Select Multiple DMSs, Restore Comm Loss Timeout for Multiple DMSs, Remove Comm Loss Timeout Backup	HMI screenshots, CHART2DMSControlIDLCclasses CD, SystemProfile CD, DMSServletClasses CD, Chart2DMSControlModuleClasses CD, MultiDMSCommLossTimeoutReqHdlr.setCommLossTimeoutForMultipleDMSs SD, MultiDMSCommLossTimeoutReqHdlr.getCommLossTimeoutBackupsList SD, MultiDMSCommLossTimeoutReqHdlr.restoreDMSCommLossTimeoutsFromBackup SD, MultiDMSCommLossTimeoutReqHdlr.removeDMSCommLossTimeoutsBackup SD, Chart2DMSFactoryImpl.setCommLossTimeouts SD, Chart2DMSFactoryImpl.setCommLossTimeoutsImpl SD, Chart2DMSImpl.setCommLossTimeout SD, Chart2DMSImpl.setCommLossTimeoutImpl SD
ATMS-1526	GUI - NTCIP Camera Details Page spelling: Maximmun to Maximum	N/A	N/A	HMI screenshot
ATMS-1685	Trigger Condition units field not blanked upon editing	N/A	N/A	HMI screenshot
ATMS-1861	Unused service(s) installed as Automatic	N/A	N/A	NONE
ATMS-1891	Upgrade JW Player version to match Cweb	N/A	N/A	NONE
ATMS-1909	CHART-ES copy jobs need to be in transaction block	N/A	N/A	NONE
ATMS-1940	Updates for CHART Services on new Current Training system	N/A	N/A	NONE
ATMS-1942	Remove ATMS installer config files for chartsys2* and chartdevapp1 servers	N/A	N/A	NONE
ATMS-1959	Lufft deployment script for adding sensors to export job was adding arbitrary characters to the column header	N/A	N/A	NONE
ATMS-1963	Create build profiles for charttrnlab servers	N/A	N/A	NONE

Requirements Doc Use Case / PR	Description	Features	Design Use Case	Other Design Elements
ATMS-1966	Remove obsolete directories / files from the ATMS codebase	N/A	N/A	HMI screenshots, DB design
ATMS-1967	Keep track of stats / report of which GUI actions have been invoked	N/A	Record User Request Usage Statistics	DB design, chartlite.servlet.GUIServletClasses CD, MainServlet.initRequestActionUsageStatPersistence SD, MainServlet.persistActionInvocationCounts SD
ATMS-1968	Make Chart On The Web and LCP links configurable for testing	N/A	N/A	HMI screenshots
ATMS-1969	Move the C++ build to its own project	N/A	N/A	NONE
ATMS-1973	Store GUI dynamic list objects in user session instead of TempObjectStore	N/A	View Dynamic List, Reset Dynamic List	HMI screenshots, chartlite.servlet.dynlist.ServletDynListClasses CD, DynListReqHdlrDelegate.viewDynList SD, DynListReqHdlrDelegate.getDynList SD, DynListReqHdlrDelegate.createDynList SD
ATMS-1975	TOLL_DATA_IMPORT in production CHART_Live DB not being cleaned up	N/A	N/A	NONE
ATMS-1976	Improve Demo ATMS with "minimal" data	N/A	N/A	NONE
ATMS-1978	Create special dev-only ability to close all alerts and traffic events	N/A	Close All Open Traffic Events (In Development / Lab Environment), Close All Alerts (In Development / Lab Environment)	HMI screenshots TrafficEventReqHdlr SD AlertReqHdlr SD
ATMS-1979	Clean up obsolete user rights	N/A	N/A	NONE
ATMS-2021	Remove obsolete DMS Protocols	N/A	N/A	HMI screenshot
ATMS-2022	Log/archive auto weather message data to explain why message was posted, or why not	N/A	N/A	DB design



